

Stress and Well-being Within Fife Fire Service

Pennie Blackburn

Submitted in Part Fulfilment of the Doctorate in Clinical Psychology

University of Edinburgh

1998



Declaration

I certify that this thesis has been composed by myself. The work contained herein is my own.

31.7.98

Pennie Blackburn

Abstract

Emergency Services Personnel are exposed to critical incidents at a far higher rate than the general population. Therefore, there may be a greater risk to people in critical occupations of developing post traumatic stress symptomatology. The aim of the study was to consider the level of stress and well-being reported in a sample of Fire Fighters. A questionnaire survey of the Fife Fire And Rescue Service was carried out which explored the relationship between demographic variables, the severity of exposure to an identified incident, on-scene and post event coping strategies and outcome measures of general health, well-being, and post traumatic stress disorder. Interviews of a small sub-sample were also conducted which provided more qualitative data concerned with aspects of work related stress. The results are discussed in the context of the current literature. Implications for the prevention of stress in Emergency Service Personnel are also considered.

Acknowledgements

My sincere thanks must go first to the members of Fife Fire and Rescue Service, without whose help and co-operation the project would never have been realised. Principal Officer (Staff) Alastair Wyse was extremely helpful in consultation at the early design stages. Station Officer (Staff) Iain Kelly was indispensable in his role in distributing the questionnaires and collecting names for volunteers, etc. I am also grateful to Principal Officer (Training) Jim Jamieson and Occupational Health Advisor Susan Donnelly for providing information regarding current training in the service. Special thanks are also due to the Fire-fighters who completed the questionnaires and particularly those who took part in the interview study.

Thanks are also deserved by Dr Frank Charlton who was an excellent supervisor, always providing the most constructive help possible, often beyond the call of duty, whilst he was still in his post. He is certainly a sad loss for the department. Thank you, also to Dr Mike Dow for his support, encouragement and comments on earlier drafts. Professor Mick Power also provided help during the writing up of the results section which was sincerely appreciated. Dr John Bogue who assumed the supervision role mid way through the dissertation process, should also be acknowledged.

I am indebted to Paul Gardner of the University of St Andrews for giving his time and his unfailing patience to provide me with statistical advice.

Thank you also to Adam Battersby, who forced me to stop working and relax, who made sure I ate and listened while I ranted and raved at every stage of the dissertation process.

CONTENTS

ABSTRACT	1
ACKNOWLEDGEMENTS	2
INDEX OF FIGURES	5
INDEX OF TABLES	6
INTRODUCTION	7
Diagnostic perspectives of PTSD	8
Theoretical perspectives on PTSD	9
The Information Processing Model	9
Cognitive Appraisal Models	11
Other Cognitive Models	12
A Psychosocial Framework	15
The Behavioural / Learning Theory Formulation	16
An Object Relations Theory Formulation	17
Psychophysiological/Psychobiological Models	17
A Cybernetic Model	18
An Ecosystemic Model	18
Why Do Some Individuals Get PTSD While Others Do Not?	21
Individual Characteristics	22
Demographic Variables	22
Psychopathology And Personality Variables	24
Locus of Control and Cognitive Appraisal	25
Coping Styles	26
Job Characteristics	28
Training	28
Length of service and Number of call-outs	29
Role Conflict	29

Event Related Variables	30
Recovery Environment	30
Social Support	30
Organisational Support and Critical Incident Stress Debriefing	31
Recovery Environment	31
Adverse Life Events	32
Summary	32
Positive Outcomes	34
RATIONALE FOR THE STUDY	36
HYPOTHESES	39
METHOD	40
Design	40
Measures	41
Participants	51
RESULTS	52
Questionnaire Study	52
Interview Study	68
DISCUSSION	73
Implications and Interpretation of Results	73
Prediction of positive and pathological outcomes	78
Summary of Discussion of results	80
Discussion of methodology	81
Design Difficulties	81
Difficulties with Measures	82
Difficulties with missing data	83
Future Research Recommendations	84

Event Related Variables	30
Recovery Environment	30
Social Support	30
Organisational Support and Critical Incident Stress Debriefing	31
Recovery Environment	31
Adverse Life Events	32
Summary	32
Positive Outcomes	34
RATIONALE FOR THE STUDY	36
HYPOTHESES	39
METHOD	40
Design	40
Measures	41
Participants	51
RESULTS	52
Questionnaire Study	52
Interview Study	68
DISCUSSION	73
Implications and Interpretation of Results	73
Prediction of positive and pathological outcomes	78
Summary of Discussion of results	80
Discussion of methodology	81
Design Difficulties	81
Difficulties with Measures	82
Difficulties with missing data	83
Future Research Recommendations	84

INDEX OF TABLES

Table 1 Factors associated with the onset and maintenance of PTSD in Emergency service workers	23
Table 2 -Varimax Rotated Factor Matrix for Primary Cognitive Appraisal	44
Table 3 -Varimax Rotated Factor Matrix for Secondary Cognitive Appraisal	46
Table 4 - Demographic Characteristics Of Participants (n=137)	52
Table 5 - Descriptive Statistics For Symptomatic Measures (n=137).....	53
Table 6 - Pearson Correlations Between The Outcome Measures (n=137).	54
Table 7 - Pearson Correlations Between Critical Incident Exposure and Outcome Measures	54
Table 8 - Pearson Correlation matrix of social support ratings and mean social support	55
Table 9 - Pearson Correlations Between Social Support and Outcome measures ...	56
Table 10 - Pearson Correlation matrix for Primary and Secondary Appraisal Factors	58
Table 11 - Pearson Correlation Matrix for Appraisal and Outcome Measures.....	59
Table 12 - Pearson Correlation Matrix for Appraisal and Outcome Measures.....	60
Table 13 - Pearson Correlation Matrix for PDEQSR and Outcome Measures	61
Table 14 - Pearson Correlations Between Coping, Peri-Traumatic Dissociation And Outcome Measures.....	63
Table 15 - Summary Of Multiple Regression To Predict Severity Of Post Traumatic Stress Following The Critical Incident.....	65
Table 16 - Summary Of Multiple Regression Model To Predict Severity Of Current Post Traumatic Stress.....	66
Table 17 - Summary Of Multiple Regression Model 2, To Predict Severity Of Current Post Traumatic Stress.....	66
Table 18 - Summary Of Multiple Regression To Predict Post Traumatic Growth...	67
Table 19 - Demographic Characteristics of the Interview Study Participants	68
Table 20 - Pearson's Correlations Of Predictive Variables With Outcome Measures	156

Introduction

A considerable body of literature has accumulated concerned with different aspects of post traumatic stress disorder since its inclusion in The Diagnostic And Statistical Manual III (DSM III 1980). Most of this literature is concerned with the primary victims of traumatic events or critical incidents. By contrast, considerably less is known about the reactions of the emergency services personnel who are called upon to carry out rescue and recovery work during those critical incidents. "Because the stresses faced by the helpers have often been unrecognised, they have been described as the 'hidden victims' of disasters" (Shepherd & Hodgkinson 1990).

During the last ten years, studies have begun to focus on the psychological effects of disaster relief work, e.g Spurrell & McFarlane 1993, James 1992, Shepherd et al 1990, Marmar, Weiss Metzler & Delucchi, 1996. Very little research, in comparison, has focused on the effects of repeated exposure to traumatic incidents in emergency service personnel during the course of their daily work, despite the fact that they have a far greater exposure to critical incidents than members of the general public. As Paton (Paton & Violanti, 1996) notes "the members of these professions are unique within the general population with respect to the frequency with which they risk exposure to traumatic events". For example, Violanti (Paton & Violanti, 1996) states that "many police officers can be exposed to more traumatic events in a month than members of the general population can expect to encounter over a lifetime".

Among the most important questions yet to be answered in the field of traumatic stress research is 'following a traumatic incident who develops Post traumatic Stress Disorder and who does not?' (Weiss, Marmar, Metzler & Ronfeldt, 1995). This question is particularly salient for people in critical occupations (Paton & Violanti 1996): that is, for people whose occupations place them at a high risk of exposure to critical incidents, such as the police, fire-fighters and emergency medical services. Dysfunctional reactions can exact substantial costs; from workers themselves in terms of a decline in physical and psychological well-being, loss of interest in their profession or personal relationships, etc. and from the organisations they work for, in terms of increased absenteeism, employee turnover and efficiency of performance at work (Paton & Violanti, 1996). Therefore the

prevention of post traumatic stress disorder and other persistent psychological difficulties (Weiss, Marmar, Metzler & Ronfeldt 1995) makes good practical sense.

In order to address the questions of prevention of traumatic stress in critical occupations, it is first necessary to identify factors which are predictive of positive and pathological outcomes following exposure to critical incidents (Peterson, Prout & Schwartz, 1991). There are few studies of the effects on emergency service personnel participating in mass disaster rescue and recovery and in the normal course of emergency service work. The existing literature is reviewed below. Before turning to the review of this literature however, it is important to place it in the context of the current theoretical and diagnostic perspectives of post traumatic stress disorder.

Diagnostic perspectives of PTSD

In 1980, Post Traumatic Stress Disorder first appeared in the third edition of the Diagnostic and Statistical Manual (American Psychological Association, 1980) as a separate diagnosis. However the concept is an old one, which was first associated with soldiers' experience of war. For example, Mott in 1919 coined the term "shell shock" which he suggested was due to a physical lesion in the brain, Myers in 1940 argued that the disorder was psychical and Kardiner in 1941 suggested that the syndrome commonly seen in war settings was essentially no different from traumatic 'neuroses' in peacetime. (Trimble, 1985). An early civilian account of the disorder can be seen in Samuel Pepys' diary in 1666 (Daly, 1983) in which he describes the Great Fire of London after which he developed "dreams of fire and falling down of buildings" six months later he reported that he was still unable to sleep "without great terrors of fire".

Freud's conceptualisation of traumatic neuroses dominated medical thinking from 1895 when he published *Studies in Hysteria* which was re-written into the DSM I (1952) diagnostic criteria for Gross Stress Reaction (Wilson, 1994). In 1917 Freud published his *Introductory Lectures on Psychoanalysis* in which he describes the three core PTSD symptom clusters found in DSM-IV (APA, 1994) nearly 80 years later. He notes that traumatic neuroses were frequent during war time but that they also appeared before the war after "railway collisions and other alarming incidents involving fatal risks" (Freud, 1917 cited in Wilson, 1994).

It was not until the publication of DSM-III in 1980 that PTSD emerged as a separate diagnostic category in which the “existence of a recognisable stressor that would evoke significant symptoms in almost everyone” was the primary criterion.

DSM-III-R (APA, 1987) revised the diagnosis by clarifying the traumatic events that might produce PTSD, elaborating the symptoms criteria and removing the acute form of the disorder (Freedy & Donkervoet 1995). The DSM-III-R diagnostic criteria are deficient on several grounds from the occupational stress perspective (Paton et al 1996). The primary difficulty is that DSM-III-R does not distinguish between the ‘normal’ distress that can result from exposure to an abnormal event and PTSD. The type of experiences that rescue workers commonly face may trigger a post traumatic stress reaction which may or may not necessarily develop into PTSD. DSM-IV goes some way to rectify this by the addition of acute stress disorder, but as Paton et al point out this “pathologizes” the response rather than recognises it as a normal reaction to abnormal events, which in turn may discourage even further the disclosure of emotional reactions within the emergency services as a sign of personal weakness (Paton et al 1996). The most recent revision of DSM (DSM-IV, APA, 1994) is based upon committee deliberations informed by the results of field trial data collected to assess the adequacy of diagnostic categories (Freedy & Donkervoet 1995). [See Appendix 1 for DSM-IV diagnostic criteria of PTSD]

Theoretical perspectives on PTSD

A variety of conceptual models have been developed to explain the formation and the resultant symptomatic picture of PTSD (Peterson & Prout 1991). Within the field of trauma research the information processing model advocated by Horowitz (1979), the psychosocial framework outlined by Green, Wilson and Lindy (1985) and the behavioural /learning theory model suggested by Keane, Zimmering & Caddell (1985) have been the most influential. These and other prominent theories are reviewed below.

THE INFORMATION PROCESSING MODEL

Horowitz’s (1979,1986) model has perhaps been the most influential of all models of PTSD, and it formed the basis for the DSM-III criteria for PTSD (Peterson et al,

1991). Horowitz model proposes that traumatic incidents involve “massive amounts of internal and external information, most of which cannot be matched to the person’s cognitive schemata because it lies outside the range of normal experience. The result is information overload: the person experiences ideas, affects, and images which cannot be integrated with the self” (Peterson et al Prout, 1991).

The individual is therefore unable to process the information and it is “shunted out of awareness. It therefore remains in an unprocessed, active or raw form.” Certain defence mechanisms such as cognitive avoidance help to keep the traumatic information out of conscious awareness. Horowitz maintains that there is a ‘completion tendency’ that causes this information to be processed until reality becomes congruent with the schematic information the individual holds. This completion tendency causes the traumatic information to intrude into consciousness, as part of information processing. Intrusions, such as flashbacks, repetitive nightmares and unwanted thoughts continue until information processing is completed. However, defence mechanisms are activated when intrusions cause information overload again. Therefore, the individual fluctuates between intrusion and avoidance before the traumatic information can be fully integrated with previously held schemata. Horowitz therefore regarded intrusions as potentially facilitating information processing and defensive operations as promoting the gradual assimilation of the traumatic experience. Completion of information processing becomes part of “long term models and inner schemata” (Horowitz 1979). “Thus at completion, the experience is integrated so it is part of the individual’s view of the world and of him or herself and no longer needs to be walled off from the rest of his or her personality” (Green, Wilson & Lindy 1985).

Horowitz’s theory is a comprehensive one which goes a long way to explain how normal reactions to trauma can become pathological or chronic. However, the theory does have certain limitations (Brewin, Dalgliesh & Joseph 1996). The theory does not explain why some people develop PTSD and others do not, nor does it give an explanation for the way in which factors such as social support may operate. In addition, it maintains that following exposure to a critical incident there is an initial period of denial which is later proceeded by oscillations between intrusion

and denial. However, this time course has not been proven and indeed other theorists suggest that the initial reaction is characterised by intrusions (Creamer et al 1992) rather than denial.

COGNITIVE APPRAISAL MODELS

Two main theories of cognitive appraisal have been proposed. Both the theories put forward by Janoff-Bulman (1985) and Epstein (1990) focus on the schematic constructs that individuals make about the world. Schemata serve as pre-existing theories they are built up early in life on the basis of abstracted information about the world from the child's experience of it. Schemata provide the basis for anticipating the future, they guide what individuals notice and remember as well as how they interpret new information (Fiske & Taylor, 1984). These schemata tend to be stable and last throughout life; new information is interpreted in the light of existing schemata and assimilated into it. They can and do change across the life span by the processes of accommodation and assimilation as new information demands.

Janoff-Bullman contends that there are three basic types of schemata or 'basic assumptions': the perceived benevolence of the world, the perception of the world as meaningful and comprehensible and the belief in the worthiness of the self. Following a traumatic experience, which is otherwise outside the realm of normal experience, the victim is faced with a 'cognitive crisis' (Janoff-Bullman 1989). The individual's assumptions are shattered by very salient critical information which does not fit with their basic assumptions. The person is then in a position of either changing their basic assumptions, upon which their whole conceptual system is based, or reworking the new information in order to integrate it within the framework of their basic assumptions. The symptoms of post traumatic stress disorder are largely a function of the cognitive dilemma that the person finds themselves in. and are seen from the "perspective of facilitating the victim's cognitive coping task" (Janoff-Bullman 1989).

According to Epstein (1990) people construct a personal theory of reality which relates to beliefs about the self and the world. The personal theory allows people to maintain a "favourable pleasure pain balance over the foreseeable future" and to "assimilate data of reality in a manner that can be coped with" as well as enables

them to “maintain a favourable level of self esteem” and satisfy their need for relatedness to other people (Epstein 1990 quoted in Peterson and Prout 1991).

The person’s theory of reality does not remain static but develops throughout life through the processes of assimilation and accommodation. When the person experiences a traumatic event which is otherwise outside the realm of normal experience, the victim may be unable to assimilate this experience into their pre-existing personal theory. “PTSD is produced by a threatening event that invalidates at a deep experiential level the three most fundamental beliefs in a personal theory of reality...The three beliefs concern the degree to which the world is seen as benevolent and a source of joy; as meaningful and comprehensible and the self as worthy” (Epstein 1990 cited in Peterson and Prout 1991)

There is growing evidence for cognitive appraisal models of PTSD. For example, Kilpatrick et al (1989) found that rape victims who experienced serious physical injury or cognitively appraised serious life threat were three times more likely to develop PTSD than those who did not. The models allow for a continuum between disordered and non disordered groups since maladaptive coping responses to the invalidation of basic assumptions is postulated to cause PTSD (Peterson et al 1991). In addition, they have the advantage of being compatible with other models of PTSD and are particularly useful for understanding the effects of critical incidents on rescue workers and emergency service personnel on the basis of the schemata that they hold about critical incidents from their work experience and training. Paton suggests that training can “incorporate increasing [the] sophistication of the schematic base, [such that] individuals would be better able to assimilate traumatic events and reduce the likelihood that work events would overwhelm their information processing system” (Paton et al 1996)

OTHER COGNITIVE MODELS

Foa and colleagues (Foa & Kozak 1986, Foa, Steketee & Rothbaum 1989) put forward a theory of PTSD which centres around information processing and the formation of a fear network in memory. The network includes information relating to cognitive, behavioural and physiological reactions to the traumatic incident as well as information about the meaning of the event, or ‘danger information’. The fear network can be activated by reminders of the incident which causes information relating to the incident to enter conscious

awareness in the form of intrusions. Avoidance mechanisms then come into play in order to suppress these intrusions. Foa et al maintain that, in order to resolve the PTSD symptomatology, the fear network must be activated and modified by including incompatible information and thereby made congruent with the rest of memory. Brewin et al (1996) maintain that Foa's network theory with a single level of representation is not powerful enough to account for concepts such as psychogenic amnesia and numbing, as these, they maintain, require a higher level of representation which cannot access information in memory. In addition, they criticise the theory because it does not explain how existing models of the world are represented by networks, or how new information is integrated into these or why some people develop fear networks and others do not.

Brewin et al (1996) propose that dual representations in memory of traumatic experiences are necessary to explain PTSD phenomenology. One representation for the person's conscious representation of the trauma which they term 'verbally accessible knowledge'. These verbally accessible memories will be reasonably detailed but may be selective since "anxiety increases attentional selectivity and decreases short term memory capacity". They "will contain some information about the sensory features of the situation, the emotional and physiological reactions experienced and the perceived meaning of the event" (Brewin et al 1996). The second representation that Brewin et al propose is that of 'situationally accessible knowledge', which contains information that cannot be deliberately accessed and comes from the "output of the more extensive non conscious processing of the traumatic situation.". This second type of representation is accessed automatically when the person is in a context which is similar to the original situation: this may be an internal event such as thinking about the traumatic situation or external event, such as a noise or another reminder. However, Brewin does not specify what form these representations take.

The Brewin et al theory proposes that emotional processing has elements of both information processing as described above and a search for meaning. "The end point of this process is to reduce negative affect by restoring a sense of safety and control and by making appropriate adjustments to expectations about the self and the world.

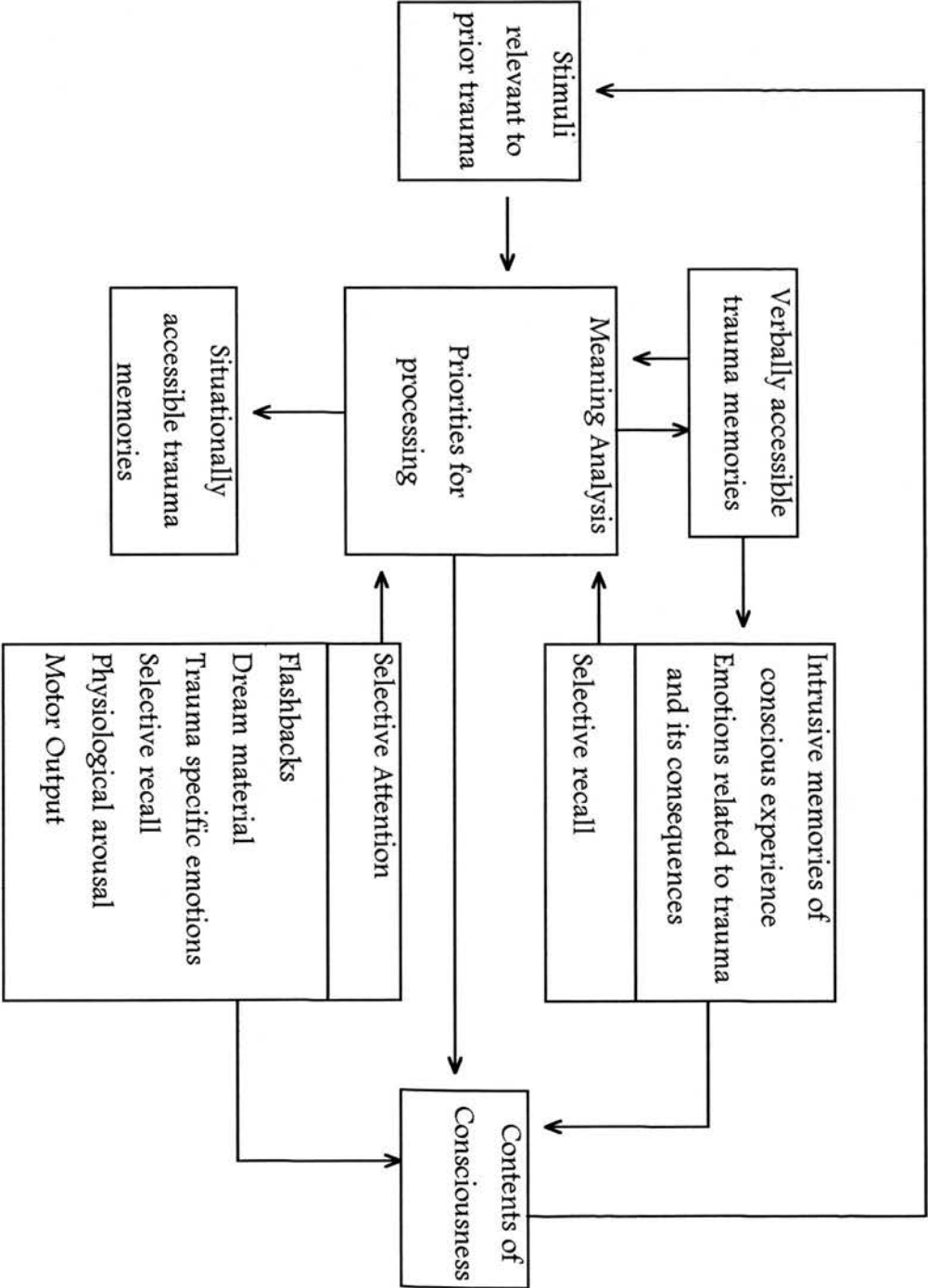


Figure 1. Cognitive Processing Of Stimuli Relevant To Prior Trauma. (Brewin et al 1996)

This theory has the advantage of explaining two separate emotional elements of the post trauma reaction, namely the fear (and other emotions) associated with the traumatic situation itself and secondary emotional reactions of the sadness anger fear etc. associated with the ongoing effects of the trauma on disruption to life, and future plans with the associated loss of valued goals, etc. Brewin proposes that three outcomes are possible from his theory including completion/integration, chronic emotional processing and premature inhibition of processing. In this manner the theory can account for immediate psychological effects of the trauma as well as prolonged chronic PTSD and a delayed post traumatic stress reaction.

A PSYCHOSOCIAL FRAMEWORK

Green, Wilson and Lindy in 1985 proposed a psychosocial model which attempts to explain why some people develop PTSD and others do not, following exposure to traumatic events. They note that specific characteristics of the traumatic experience are important in the long term response. These include the severity of the stressor, the duration of trauma, the warning speed of onset, the degree of bereavement, the degree of displacement of person/community, the proportion of the community affected by degree of life threat, the level of participation in the trauma (including the role taken by the survivor whether active or passive), the degree of exposure to death and the degree of moral conflict and the potential for and/or control over reoccurrence of a similar incident.

The characteristics of the individual are also important. Variables considered salient are ego strength, effectiveness / nature of coping resources/defenses, presence of pre-existing psychopathology, prior stressful/traumatic experiences, behavioural tendencies, current psychosocial stage of the individual (Erikson 1968) and demographic factors (age, SES, education, etc.)

Green et al argue that the 'recovery environment' is also related to the outcome. Environmental factors include, social support, protectiveness of family and friends or the 'trauma membrane', the attitudes of society, intactness of community and cultural characteristics. For example, rape victims and Vietnam veterans often experience a less supportive recovery environment than victims of disaster or assault. This is an important factor for emergency service personnel who often experience a less than supportive recovery environment in which difficulties coming to terms with a traumatic experience may be seen as a personal weakness.

This therefore discourages disclosure and exacerbates the likelihood of prolonging any difficulties that may arise and may increase vulnerability to subsequent call-outs

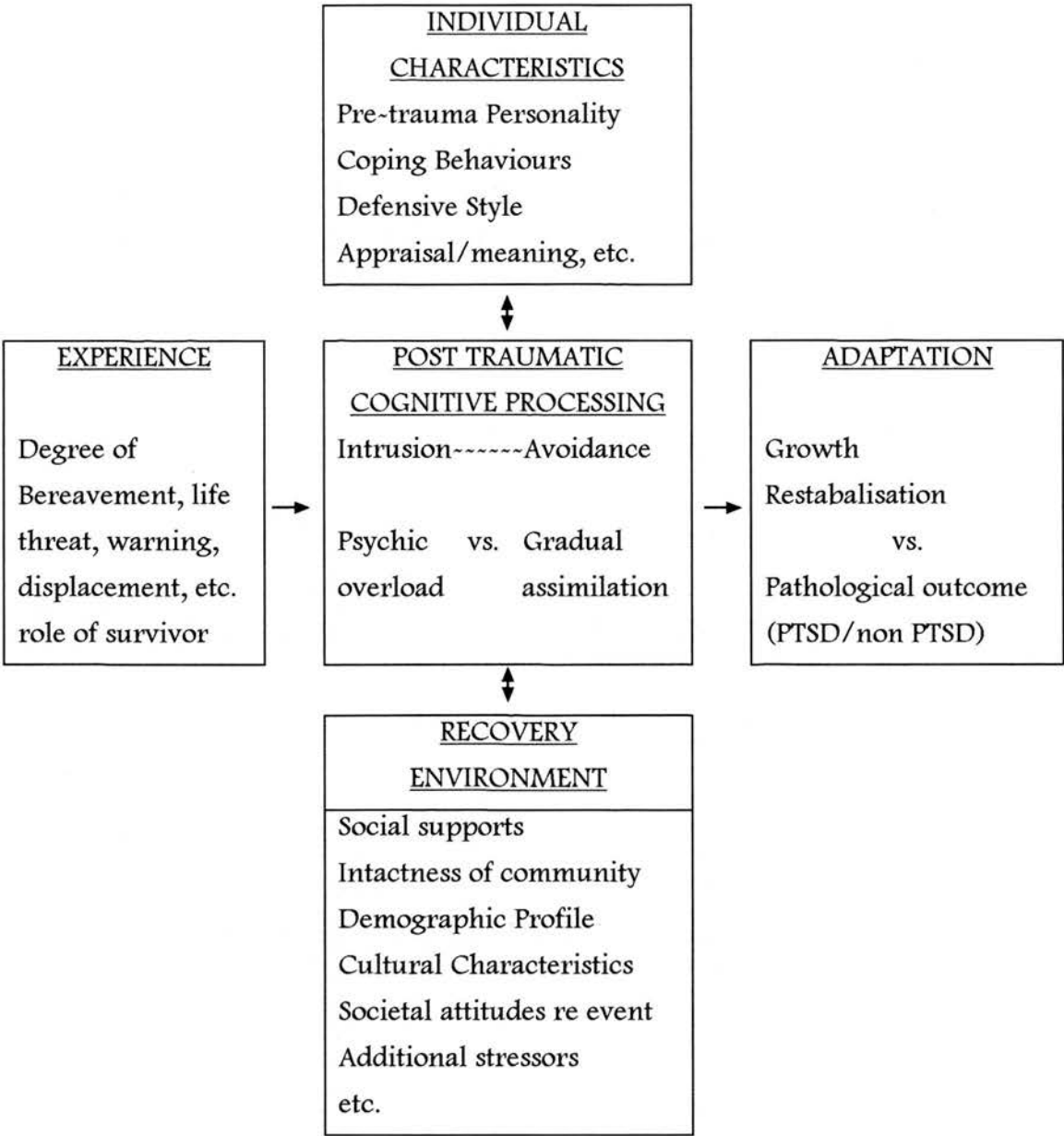


Figure 2 . A Psychosocial Framework (Green et al 1985)

THE BEHAVIOURAL / LEARNING THEORY FORMULATION

Substantial evidence points to the effectiveness of a behavioural treatment for PTSD and so an understanding of the behavioural/ learning theory of PTSD would appear to be important. Keane et al (1985) proposed a two factor learning theory

account of the acquisition and maintenance of PTSD. The two factor learning theory was originally postulated by Mowrer in 1947 and 1960 and states that psychopathology is a function of both classical conditioning and instrumental learning whereby individuals learn to avoid conditioned cues that evoke anxiety. In this account the individual becomes classically conditioned in a single 'trial' to a certain signal or cue or series of cues which represent the traumatic experience. E.g. in one case reported to the author, the sound of an aeroplane was an extremely potent trigger for intrusive imagery of a gas explosion since the sound of an aeroplane is very similar to that of the noise immediately prior to a gas explosion. Once a cue has been conditioned to elicit fear the cue itself can become fearful, avoidance of the cue can then become negatively reinforced such that extinction cannot occur since only incomplete exposure to memories are experienced and may increase the likelihood of incubation of conditioned anxiety

AN OBJECT RELATIONS THEORY FORMULATION

Brende's Object Relations model of PTSD rests upon the power of the trauma to effect 'splits' in personality (1982,1983, taken from Peterson et al 1991). With Vietnam veterans such splits bring about characteristic 'part self identifications', such as the killer self. [Brende notes that the attempt to consolidate an idealised mental construct of being a man during military training often led to a pathological , idealising identification with an aggressor, with the ensuing development of a killer identity. Combat experiences often consolidated the identification with the aggressor, hence the killer self.] The emphasis on splits in personality complements other theories which emphasises the dissociative quality of PTSD that was reflected within the DSM-III-R committee's discussion whether to place PTSD among the dissociative disorders.

PSYCHOPHYSIOLOGICAL/PSYCHOBIOLOGICAL MODELS

De la Pena (1984, taken from Peterson et al 1991) suggested that some individuals have a physiological predisposition towards PTSD. He suggested that this explained why Vietnam veterans with PTSD frequently become more relaxed with stimulants and more anxious with depressants. He suggests that stimulants return information flow in the brain to preferred levels, whereas depressants lower an already lowered level of information flow. Van der Kolk proposes that initiation and maintenance of PTSD are mediated by altered brain physiology. Although physiological models can be useful in providing a more coherent, universal

understanding of the disorder they are often used to look for a 'magic pill' and overlook the psychological factors involved (Peterson et al 1991).

A CYBERNETIC MODEL

"Schultz (1984) proposes a cybernetic model of PTSD which builds upon prevailing Psychodynamic and behavioural models of the disorder. Although it is similar to the Green et al (1985) psychosocial model it adds a cybernetic understanding to various interactions and feedback loops" (Peterson and Prout 1991). The cybernetic model adds a systems theory perspective to the understanding of the disorder. Schultz's cybernetic model includes both psychological and psychological dimensions. The cybernetic model introduces circular causality into the theory and therefore understands persistent symptoms of PTSD as epiphenomenon of a cybernetic circuit. In this way symptoms last as long as the circuit remains intact.

Amplification in the circuit goes on until it is broken or the feedback loop is suppressed by some other 'higher order mechanism', such as avoidance, emotional numbing, depression or denial. Both medication, symptoms and the social environment are seen as factors which can impact on the original cybernetic circuit and cause 'deviation reduction'. Therefore in order to resolve the symptomatic picture the cybernetic circuit must be broken and the old type of self regulatory or suppressing behaviours must be replaced by new more effective ones.

AN ECOSYSTEMIC MODEL

Peterson and Prout put forward an ecosystemic model of PTSD based on the integrated model of Green et al (1985).

The model proposes that the path towards PTSD is initiated with the traumatic experience. How the person experiences the event is the first factor which will influence the development of PTSD. Such variables include the intensity of trauma, the degree of life threat, etc. The experience of the trauma then affects three other variables. The first post traumatic cognitive processing, follows the Green et al psychosocial model (1985). Secondly, the nature of the experience impacts on the recovery environment; for example the rape of an individual woman and a terrorist attack will elicit different responses in the environment in which recovery

is to take place. Thirdly, the conditioning response to the event will differ according to variables of the event. The more intense the trauma the more likely it is that a strong conditioned response will occur, the variables of the event also determine the type of stimuli that will become conditioned. In addition, following the Mowrer two factor learning theory (1947,1960), negative reinforcement of avoidance behaviour occurs which they describe as 'respondent conditioning'.

Green et al (1985) subsume cognitive appraisal and meaning factors under individual differences. Peterson and Prout (1991) afford them a higher degree of importance and separate this category of factors out. They believe that three perspectives of appraisal are important. Firstly, appraisal is important in terms of the specific appraisals the person makes of the incident and the events that follow. For example, the degree of perceived life threat has been discussed above as an important factor. Secondly, appraisal is closely related to pre trauma personality and coping style. The important appraisals in this perspective are how the person integrates the trauma with the context of the rest of their life e.g. is the trauma seen as one more example of being traumatised? Thirdly, at a more macro level cognitive appraisal is important to the degree to which the persons assumptive world (Janoff-Bullman 1985) or personal theory of reality (Epstein 1989) or schamata are threatened. The greater the breakdown of these basic beliefs the greater the likelihood of an extreme post traumatic stress reaction. The persons' individual characteristics, their pre trauma personality, the breadth of their repertoire of coping behaviours and the rigidity of their defensive style will all impinge on the vulnerability of their basic belief system.

Within the ecosystemic model the factors described above are surrounded by a cybernetic deviation amplification circuit (CDAC). This circuit can have a positive or negative directional effect. Further more, the degree of amplification can vary. The CDAC can be viewed as a conduit for interaction between different variables. However, it can also act in a more active way. Once the CDAC has been set in motion it influences the other variables in a unidirectional manner with

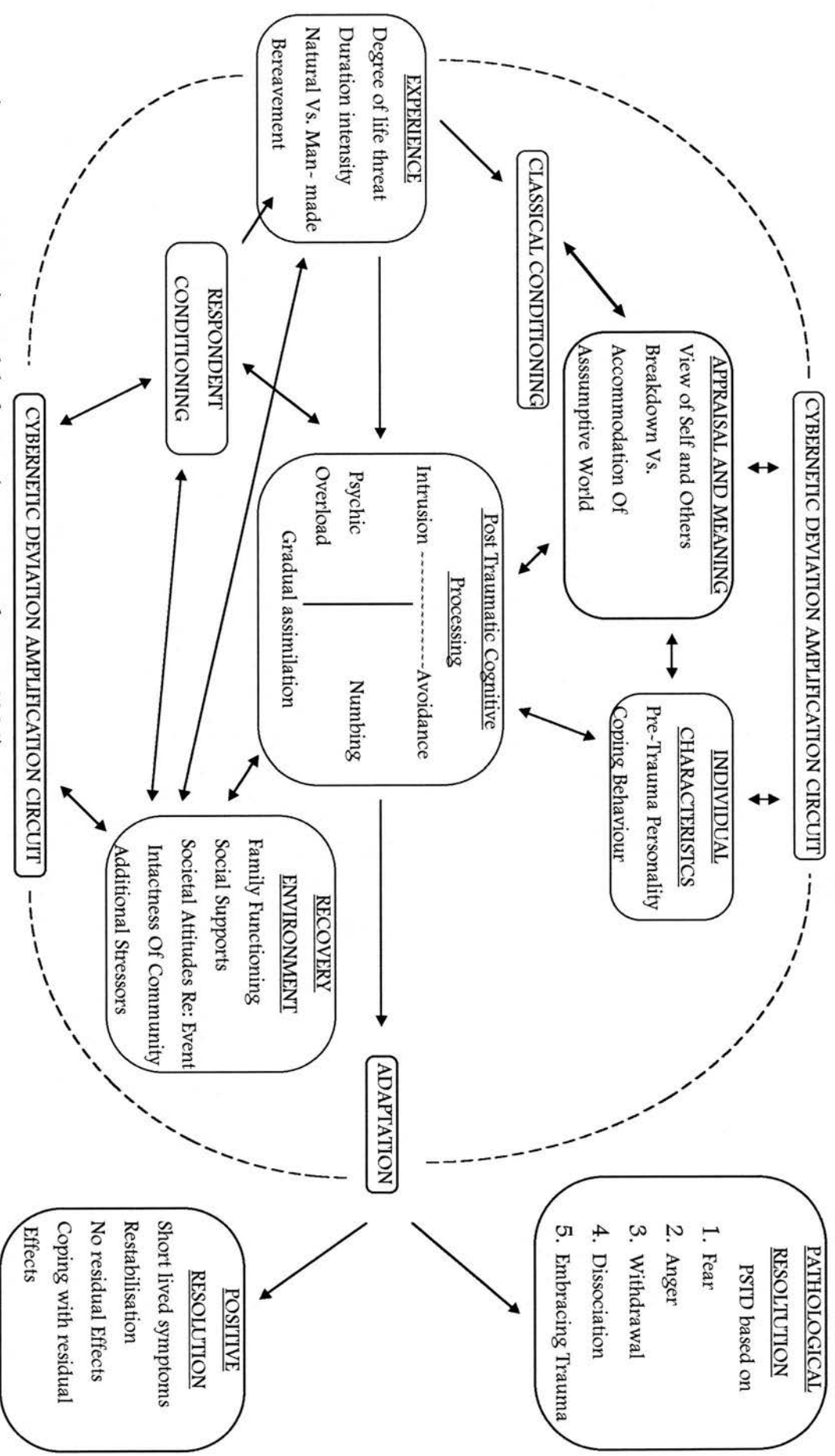


Figure 3. Ecosystemic Model of PTSD (Peterson and Prout 1991)

increasing amounts of amplitude, such that any single change in other components may be over ridden.

Finally, the Peterson and Prout model provides for several outcomes. The course of adaptation to trauma can have a pathological or positive resolution. Post Traumatic stress disorder or other non PTSD disorders may result, following on from generalisation of fear, anger, withdrawal or embracing of the trauma.

Alternatively, a more positive resolution may be attained. The person may have relatively short lived symptoms which fall within the normal range and the degree of disruption to normal functioning is minimal, or there may be restabalisation where the person resumes a previous level of functioning. They may be free of residual symptoms or experience some residual symptoms but cope with them effectively. In addition a genuine positive growth may result from working through the trauma allowing people to assume a new level of maturity and functioning.

The Ecosystemic model is useful since it allows for a range in outcomes to be considered and leaves room for positive outcomes which are often overlooked in the field of trauma research. The model also provides a useful framework for the integration of the most important aspects of several theories. The inclusion of appraisal is useful as it facilitates the identification of factors which predispose people to viewing the incident as traumatic. This is particularly important for the emergency services since the perception of what constitutes a traumatic incident may be different from the general public. This allows research to consider the importance of previous training and experience in the reaction to critical incidents. It is also useful in its consideration of individual characteristics and the recovery environment in the model, which may be important for understanding the effects of repeated exposure to critical incidents during the course of a single persons career.

Why Do Some Individuals Get PTSD While Others Do Not?

Although the experience of a traumatic event is a necessary condition of the subsequent development of PTSD, exposure itself is not sufficient to explain the onset and maintenance of the disorder. Several factors have been identified in the literature which help to explain why some emergency service workers develop PTSD whilst

others do not, following exposure to a traumatic event. Following Green et al (1985) these can be divided into characteristics of the individual, the event, and the recovery environment (see Figure 2). The following discussion is restricted, in the main to studies that identify risk factors for PTSD in 'critical occupations' (Paton and Violanti 1996) for example, the military and emergency service personnel.

Individual Characteristics

Relevant individual factors include personality variables, previous psychopathology, demographic variables, personal perception of the event, coping styles and for occupational stress, variables related to the job and organisation the individual works for. As Table 1 shows these can be divided into several factors each of which may have an effect on the subsequent onset and maintenance of PTSD.

DEMOGRAPHIC VARIABLES

Few consistent findings can be found in literature describing the relationship between the demographic variables describing individuals exposed to traumatic incidents and their level of psychopathology (Gibbs 1993). For example, Wilkinson (1983) found that older victims and rescuers in the Hyatt hotel skywalk collapse tended to have a higher frequency of symptoms. However, most of the victims were in older group and most of the rescuers were in the younger group which may have confounded the results. By contrast, Taylor and Frazer (1982) found that older rescue workers were less distressed than younger ones, but this is also confounded by length of experience the workers had, such that older rescue workers tend to have greater level of experience, which may ameliorate the severity of the stress reaction.

Table 1 Factors associated with the onset and maintenance of PTSD in Emergency service workers

<u>INDIVIDUAL CHARACTERISTICS</u>	<u>EVENT CHARACTERISTICS</u>	<u>RECOVERY ENVIRONMENT</u>
<ul style="list-style-type: none"> • <u>Demographic variables</u> <ul style="list-style-type: none"> Age Gender • <u>Personality /Psychopathology</u> <ul style="list-style-type: none"> neuroticism / hardiness psychiatric history Locus of control Schemata Life events • <u>Job Characteristics</u> <ul style="list-style-type: none"> Training Role Conflict Number of callouts Length of Service • <u>Event related Person variables</u> <ul style="list-style-type: none"> Appraisal of event Coping Strategies Peritraumatic Dissociation 	<ul style="list-style-type: none"> • Intensity • Duration • presence of onlooker's • children or young people involved • first experience of death • multiple deaths • being unprepared for the incident • Knowing or identifying with the victim • Large scale incidents • Threats to own safety • work conditions 	<ul style="list-style-type: none"> • Social Support • Organisational Support • Debriefing / Professional Counselling • Ongoing Stressors • Society Attitudes • Media Attitudes • Community Attitudes • Cultural Attitudes • Organisational Attitudes

Some researchers suggest that female emergency service workers tend to show more symptoms than their male counterparts (Gibbs et al 1993, Dyregrov 1989). However, such findings must be interpreted in the light of the different roles that men and women carry out in emergency service work. In addition, women are more likely to disclose negative emotional effects and men and women tend to suffer different types of symptoms. Studies of civilian victims of disasters generally show that when a wide range of disorders are considered, male and female levels of psychopathology are equivalent (Gibbs 1989). For example Glesser et al (1981) showed that the female

victims of the Buffalo Creek disaster suffered more anxiety and depression symptoms whilst their male counterparts tended to show more alcohol abuse and 'belligerence'. Gibbs in his reviews (1993, 1989) of predictive factors of the effects of traumatic exposure concludes that there are no consistent findings relating to social class, race or marital status.

PSYCHOPATHOLOGY AND PERSONALITY VARIABLES

It is commonly assumed that individuals with a history of psychopathology are more vulnerable to the psychological effects of disasters. However, because of the difficulty in obtaining pre-disaster measures of functioning there is very little evidence to support this assumption (Gibbs 1989). Most studies rely on retrospective self report of previous mental health state. However, individuals suffering from more post traumatic stress symptoms may have a biased recall of their previous mental health state, and therefore report more difficulties than were actually present. In order to overcome this difficulty some studies have used victim's past psychological or psychiatric treatment as a more objective indicator of psychopathology.

McFarlane (1989) in a study of 469 trained volunteer fire fighters who responded to an Australian bushfire disaster, found that neuroticism and a previous history of treatment for a psychological disorder were predictive of post traumatic morbidity. However, Wilkinson's study (1983) of 102 disaster workers at the Hyatt hotel skywalk collapse, found no differences between those who had been in psychotherapy and those who had not. Therefore, the findings are contradictory.

McFarlane (1989) in contrast found that neuroticism assessed at 29 months following the event predicted post traumatic stress disorder, although McFarlane acknowledged that this measure could have been confounded by the timing of the data collection. Thompson & Man Chueng Chung & Rosser (1994) found that neuroticism measured in victims after the marchioness disaster was higher than population norms but did not correlate with measures of distress.

Bartone, Ursano, Wright & Ingraham (1989) showed that hardiness as a personality characteristic moderated stress in emergency service workers. However, Moran and

Britton in 1994 found no evidence that emergency service workers were any hardier than the general population. They surveyed volunteers using the SCL-90-R which yielded symptom scores within normative levels and found no association between personality variables (using the hardiness scale and defence style questionnaire) and length or severity of a stress reaction to the worst traumatic experience they had worked at.

Although some evidence shows an association between pre-existing personality variables / psychopathology and post traumatic stress, pre-trauma measures or time series studies are needed in order to confirm such a link.

LOCUS OF CONTROL AND COGNITIVE APPRAISAL

Several studies have found an association between locus of control and PTSD symptomatology in the general population. Kushner, Riggs, Foa, & Miller (1992), for example, found that perceived controllability over aversive events was associated with symptom severity in a group of female assault victims and that this was independent of the severity of the assault itself.

The concept of control expectancies (Rotter 1966), rescue expectations and cognitive appraisal of the critical incident, including the anticipated stressors, have all been identified as powerful mediators of workers' response to exposure (McCammon, Durham, Jackson & Williamson 1988; Hartsough, 1985; McCammon 1996). The concepts of control expectancies before arriving at the incident and cognitive appraisal of the incident once the worker is on site, are two concepts that have been consistently highlighted in many of the theories outlined above (Horowitz 1986, Janoff-Bulman, 1985, Epstein 1990, Green et al 1985, Peterson and Prout 1991) as well as having empirical support.

Solomon et al (Solomon, Mikulincer & Avitzur 1988; Solomon, Mikulincer & Berbenishty 1989) found that locus of control was significantly correlated with PTSD symptomatology in soldiers suffering from a combat stress reaction following the Lebanon war; "the more internal the control expectancies,...the fewer their PTSD symptoms" (Solomon 1989). In addition, Weiss et al (1995) in a study of 154 rescue

workers at the Nimitz Freeway collapse found that external locus of control was predictive of increased PTSD symptomatology. Gibbs (1989) in a review of victims of disasters, concludes that higher internal locus of control has consistently been linked with lower negative emotional effects of the disaster.

However, as Gibbs also notes, there are limitations to these findings, since pre-disaster measures are almost always unavailable and therefore causality has not been proven. For instance, it may be that retrospective report of control expectancies and appraisal is biased according to the outcome. In addition, both concepts appear to be associated with coping styles which may also confound the results of these studies. For example, Solomon et al (1988) found that control expectancies were significantly correlated with emotion focused coping, which he suggests may indicate that coping strategies may be a more reliable mediator between Locus of Control and PTSD.

As Paton (1994) notes, control expectancies and cognitive appraisal are influenced by currently held schemata which in turn are also influenced by previous training and experience. Therefore, in extreme situations where these schemata do not easily accommodate the traumatic information, emergency service workers may be more vulnerable to negative emotional effects. However, it also follows that effective training can be an important factor in providing adaptive schemata which can promote well-being and minimise the stress response. Therefore, this may be an important area in which further empirical investigation is warranted.

COPING STYLES

The issue of coping is complicated by the several ways in which it can be conceptualised. Lazarus and Folkman (1984) divide coping broadly into two types; problem focused and emotion focused. Problem focused coping refers to some effort to change or master some aspect of the person, situation or environment that is perceived as stressful. Emotion focused styles of coping, refer to efforts to manage or regulate the negative emotions associated with the stressful episode. Others for example categorise coping into avoidance and approach styles (Billings and Moos 1981). Different studies use different categories of coping styles and strategies,

measure them in different ways and at different times and therefore overall consistent findings can be difficult to tease out.

Several of the theories reviewed above suggest that coping styles are potent moderating and mediating variables between the traumatic incident and the degree of stress response that follows (Horowitz 1986, Janoff-Bulman, 1985, Epstein 1990, Foa et al 1986, Brewin 1996, Green et al 1985, Peterson and Prout 1991). Research studies have begun to focus upon the coping mechanisms that rescue workers utilise during and after critical incidents. Most of these studies are exploratory (Werner, Bates, Merdoch & Robinson 1992, McCammon et al 1988, Holaday, Warren-Miller, Asmith & Yost 1995) and simply identify the coping strategies that rescue workers report using. There are very few studies that look at the relationship between coping and stress response in critical occupations (Spurrel and McFarlane 1993, Weiss et al 1995, Marmar et al 1996). Those studies that do consider this relationship generally suggest that cognitive avoidance is associated with higher levels of stress following a critical incident.

Marmar et al (1996) and Weiss et al (1995) in two studies of 358 emergency service workers, suggest that peritraumatic dissociation was a strong predictor of post traumatic symptoms. Peritraumatic dissociation was strongly associated with avoidance styles of coping but also with approach styles to a lesser extent. Peritraumatic dissociation was also associated with external locus of control and greater exposure and greater perceived threat. This suggests that cognitive avoidance and dissociation tend to increase the negative emotional effects of rescue work. These two studies did not separate cognitive avoidance on-scene and post event. It may be that avoidance during and after the event need to be distinguished and that whilst dissociation during the event is maladaptive, cognitive avoidance may not be, further empirical investigation must be conducted in order to clarify this point.

Very few studies separate on scene coping and post-event coping strategies (Werner 1992, Dyregrov and Mitchell 1992). Exploratory studies suggest that while responding to critical incidents approach styles of coping are important behaviourally and cognitive avoidance is common. That is, emergency service workers tend to focus

on the practical tasks at hand, they keep busy and suppress emotional and cognitive responses to the incident (Dyregrov and Mitchell 1992, Werner 1992). Cognitive avoidance on-scene may be adaptive in so much as this facilitates the job at hand and increases performance effectiveness (Myers 1995, Roth and Cohen 1986). For example McCammon et al (1988) noted 78% of emergency workers that responded to a tornado, reported that they reminded themselves that they were providing help. Gibbs et al note(1993) that in the AVIANCA air crash workers effectiveness in preventing loss of life was “strongly and negatively associated with fewer symptoms” suggesting that such positive reappraisal may ameliorate the effects of stress. Following the event, studies suggest that approach styles of coping are used more often (Werner 1992) and are more effective in reducing the stress response (Roth and Cohen 1986, McCammon et al 1988, McFarlane et al 1988, Solomon 1989).

Job Characteristics

TRAINING

Effective training is recognised, by most emergency service organisations, as an important factor in mitigating negative emotional effects of exposure to traumatic events. Fullerton et al(1992) emphasise that training is important in helping emergency service workers to keep on task during a critical incident, and in maintaining a sense of control over the incident. From a series of case studies of fire fighters, they conclude that when “training effects are missing the rescue workers experience of the disaster is more likely to be lonely, filled with guilt over poor performance, feeling out of control and feeling like a victim.” For example, several studies show that among the most important event characteristics predicting stress responses of emergency service workers are feeling unprepared for the incident (Werner et al 1992) and fear of the unknown (Fullerton et al 1992). Paton et al (1994) suggested that the evaluation of training effectiveness in emergency service work can be conceptualised within the schema theory account of traumatic stress (Horowitz, 1993, Jannoff-Bulman, 1989). Promoting adaptive professional schemata for responding to emergency situations would be expected to promote well-being and minimise negative emotional effects. As Paton (1996) concludes “training should take place in different contexts to generalise understanding, promote predictability, control

and adaptability and ensure that operational schemata will promote well-being and performance effectiveness under a wide range of circumstances”.

LENGTH OF SERVICE AND NUMBER OF CALL-OUTS

The effect of experience and length of service on post traumatic stress reactions is unclear. There is some face validity both to the assumption that greater experience leads to better performance and lower stress levels and in contrast that repeated exposure to traumatic incidents has a cumulative effect. Raphael (1986) suggests that past experience in disaster mitigates against negative reactions. Moran and Britton (1994), in contrast, found that those with more experience as emergency workers were more likely to report more severe reactions to their ‘worst incident’. Moran and Britton also found that the number of callouts or the busyness of the unit was related to the risk of exposure to distressing events, which suggests that the frequency of responding may be an important variable.

It is likely that the effect of experience is not unidirectional. That is, it may be that repeated experience of successful responses to emergency situations, may increase the workers’ sense of controllability of traumatic incidents and predispose them to adaptive coping strategies and lower stress levels. Similarly, following exposure to a critical incident that had negative emotional effects, there maybe an increase in the emergency service workers’ vulnerability to subsequent events. Further research is needed in order to tease out the effects of experience on emergency service workers psychological response to critical incidents.

ROLE CONFLICT

Dunning (1980) has emphasised the importance of role conflict in increasing stress for the emergency worker. McCammon (1996) reviews studies which identified role conflict as a factor and draws attention to three types of role conflict that have been found to be particularly distressing. These include the conflict that can arise when a worker is responding to a situation in their home locality. McFarlane (1989), for instance described how many of the fire fighters who responded to the bushfires in Australia he studied, lost their homes in the blaze. Wilkinson (1988) reported that several of the fire-fighters who responded to the Hyatt hotel skywalk collapse who he

interviewed had been aware that the fire chief had been attending a function at the hotel and were particularly distressed by this. Secondly, role conflict arises between emergency response roles. For instance, Fullerton (1992) described fire fighters responding to an aeroplane crash who had to focus on putting out the fire rather than helping some survivors who were still strapped into their seats. Thirdly, McCammon (1996) notes that several studies have described role conflict arising when rescue workers become body handlers, that is, when the implied hope in rescue work is lost. This point is also supported by several findings that events in which there are multiple fatalities are particularly stressful for emergency service workers (Werner 1992).

Event Related Variables

Perhaps the most consistent finding in the literature is that the severity and intensity of the incident is predictive of the degree of traumatic stress (Paton et al 1996). Studies of rescue workers in disaster situations have identified that certain factors associated with the critical incident, such as children or young people involved; the rescuers first experience of death; multiple deaths; knowing or identifying with the victim; threats to their own safety and the presence of onlookers are particularly salient (Weiss 1995, Werner et al 1992, Wilkinson, 1992, Wilson et al 1985).

Recovery Environment

SOCIAL SUPPORT

Social support has been identified as an important factor in the mitigation of negative emotional effects on emergency service workers (Gibbs et al 1993). Foa et al (1989) argued that recovery from trauma is facilitated by discussion of emotional sequelae within a socially supportive environment. Bartone et al (1989) reported that social support had a protective effect for workers at an aeroplane crash recovery. Solomon (1988) also reported the importance of social support in ameliorating stress in Israeli soldiers. Jenkins (1997) found that social network deficits were associated with higher general distress in emergency workers responding to Hurricane Andrew. However, as Gibbs (1993) points out, the direction of correlation between lack of

social support and distress cannot be determined from such studies and it may be that psychological difficulties lead to perceptions of lowered social support.

ORGANISATIONAL SUPPORT AND CRITICAL INCIDENT STRESS DEBRIEFING

Critical Incident debriefing was originally developed by Mitchell in 1983 as a form of crisis intervention for the prevention of post traumatic stress symptomatology in fire fighters involved in disaster work (Tehrani & Westlake 1994). However, the evidence for the effectiveness of critical incident debriefing is contradictory. Stephens (1997) in a study of 527 New Zealand Police Officers found that there were no significant differences between those who had received debriefing and those who had not. However, greater social support and opportunities to talk about traumatic incidents and their emotional impact with others in the work place were shown to be related to fewer PTSD symptoms. Stephens suggests that psychological debriefing must have 'ecological fit' and enhance person community/peer relationships. As Gibbs notes "One important factor of debriefing is to strengthen the support aspects of the emergency team".

RECOVERY ENVIRONMENT

Wilson and Krauss (1985) studied Vietnam veterans and their research supports the general assumptions of the psychosocial model and identified two broadly different outcomes of a traumatic experience: pathological, in which PTSD or other disorder result and 'personal growth and restabilisation' which results from full working through of the trauma. They found that the best predictors of PTSD were the severity of the stressor and the degree of psychosocial isolation in the recovery environment. "If exposure to traumatic stressors in combat lays the foundation for potential changes in the personality structure of the survivor then the recovery environment may determine whether or not the post trauma adaptation is pathological or positive in nature" (Wilson & Krauss, 1985).

The social and organisational environment may influence recovery following critical incident exposure in many ways. Social and organisational conventions, norms and

roles, exercise a considerable influence on individuals. Following exposure to critical incidents these factors may be extremely influential in the recovery process.

“Occupational groups at risk for experiencing work related trauma such as police, fire-fighters, military personnel and nurses form cohesive social groups with a distinctive culture” (Paton and Stephens 1996). This culture tends to emphasise machismo and to perceive emotional expression as an occupational and or personal weakness (Paton et al 1996, Paton 1997, Hartsough 1995). As a result, emergency service workers appear to under-report emotional difficulties they experience following exposure to traumatic events (Alexander 1991, McLoed 1992). This in turn is likely to minimise the support they receive from peers and from superior officers increasing their vulnerability to longer lasting negative emotional effects. Bartone et al (1989) notes emergency service workers have an invested interest in denying their own vulnerability, and Moran and Britton (1994) note that reporting negative emotional responses to traumatic incidents is socially undesirable in terms of the cultural image within the organisation [New South Wales Emergency Services and Volunteer Bushfire Brigade Units, Australia].

ADVERSE LIFE EVENTS

McFarlane (1989) in his study of fire fighters responding to serious bushfires in Australia, found that adverse life events were not as predictive of traumatic stress as premorbid vulnerability factors, but they became more important over time. At 29 months following the event, life events had a greater impact (explaining 12% of the variance in post traumatic morbidity). He interpreted this finding as indicating that adverse life events are important in maintaining a post traumatic stress reaction rather than precipitating it.

SUMMARY

Several ‘risk’ factors for PTSD have been suggested by theoreticians and researchers, although only a few have been empirically supported consistently throughout the literature and accounted for within the prevailing theories.

The empirical evidence for an elevated risk through previous psychopathology is contradictory. The evidence for particular personality styles, such as neuroticism and hardiness, as risk factors, is supported in the literature but it has not been proven,

since data collection tends to be post trauma and therefore retrospective self report may be biased by outcome. Studies do not support the idea that emergency service workers tend to have particular personality styles. The evidence for locus of control as a risk factor is also supported, but there are methodological difficulties which make it difficult to prove. Locus of control correlates well with coping strategies and therefore the concept of locus of control is difficult to separate out from coping. Few studies exist of the role of cognitive appraisal of critical incidents. The results of the studies that do exist, appear to support cognitive appraisal models of post traumatic stress. However these studies also rely on retrospective self report which may be biased by outcome. The cognitive appraisal and schema theories of post traumatic stress disorder provide considerable potential for the prevention of traumatic stress reactions in critical occupations. Therefore further research is needed in order to clarify the role of cognitive appraisal of the critical incident in the development of post traumatic stress disorder.

It appears that the role that coping mechanisms play in the onset and maintenance of PTSD is a complex one, which also warrants further empirical investigation. It is hypothesised in this study that cognitive avoidance is both adaptive and necessary during work at the scene in order to facilitate activities focused on the job at hand. However, dissociation during the event may be maladaptive both emotionally and for effective performance. Once the incident is completed cognitive approach coping strategies are necessary to ameliorate the stress response.

Studies of post traumatic stress disorder in critical occupations have not consistently identified any predisposing demographic variables. Length of experience and age of the emergency worker are highly correlated and therefore the role of each is difficult to separate out. The relationship between length of experience and traumatic stress reactions following critical incidents may not be a linear one.

The effects of length of service and the number of call-outs may have an effect on the stress and well being of emergency workers, however, the relationship is unlikely to be a simple one. There is little evidence that previous training prevents a stress reaction. However, many of the studies are concerned with severe disasters. Events

that are outside the range of normal experience even for the emergency services. Schema theories suggest that it may be possible to equip emergency workers with adaptive schemata through training which are flexible enough to assimilate a wide range of emergency situations, thereby preventing stress reactions. However, further research is needed on the efficacy of such preventive training programmes. Studies of job characteristics suggest that role conflict is an important predisposing factor in the onset of PTSD.

Studies of the event characteristics themselves universally support the assumption that the more intense and severe the exposure to the critical incident the higher the risk for a post traumatic stress reaction.

The recovery environment is important in the context of the maintenance of any traumatic stress symptomatology. The amount of social support available from friends, and family, as well as from peers and other colleagues seems to be important. In addition, the cultural context of the organisation also plays an important part in the individuals ability and inclination to seek support, both in the prevention of a natural stress reaction becoming pathological in nature and in the way it can be managed and resolved.

To summarise, the mediating and moderating factors that have been identified most consistently in critical occupational traumatic stress are personality, social support, control expectancies, cognitive appraisal, coping styles, role conflict, the severity of the incident and the nature of the recovery environment. In addition training, cognitive appraisal, coping strategies and the recovery environment are factors which have the most potential for the prevention of prolonged traumatic stress reactions. The aim of the present study was to explore the most likely predictive variables of post traumatic stress symptomatology in a group of fire fighters who respond to critical incidents in the course of their normal duties.

POSITIVE OUTCOMES

It is important to note that, although emergency service personnel may be at a higher risk of developing post traumatic stress symptomatology than the general population,

the prevalence of such difficulties is still not high. Emergency service personnel respond to critical incidents frequently and most are able to do so over the whole period of their careers with little or no difficulty. Generally the job is carried out with pride and with satisfaction, positive outcomes are possible. Very few studies have considered the positive outcomes following critical incidents. How it is possible for emergency service workers to respond to critical incidents so frequently, when as studies show they do not differ significantly in personality from the general population, is an interesting question. What it is that enables emergency service personnel to respond to critical incidents, which can and frequently do cause post traumatic stress symptomatology in the victims involved, is also an important question. The answer may provide very important information for trainers of emergency service personnel as well as for psychologists and others who are involved in the theory and therapy of post traumatic stress. Although the emphasis of the preceding pages has been to identify those factors which place people at risk of developing PTSD, the aim of the study is also to explore the factors which protect the emergency services from such difficulties.

Rationale for the Study

Most of the studies reviewed above considered the effects of emergency service work in the context of major disaster and rescue operations. The main aim of this study was to replicate the findings above in a sample of fire-fighters in order to explore whether the same risk factors are applicable to emergency service workers responding to incidents during the course of routine operations.

It was important methodologically to ensure that workers were responding to the questionnaire items in as reliable a fashion as possible. Rather than enquire about how critical incidents are normally perceived and coped with, it was decided that responses would be more reliable if given in relation to one single incident. Since there was no one major critical incident that all the fire fighters had responded to, and since it was deemed to be important to attain a range of positive and negative outcomes, it was decided that the participant should identify an incident which 'would usually be very distressing to a member of the general public'. All other questions would then be answered in relation to this incident, except for current measures of stress and well-being. In order to standardise the incidents described an objective measure of exposure was used.

The risk factors that were identified most consistently in the literature reviewed above were: the severity of the incident, personality, social support, cognitive appraisal, control expectancies, coping styles, role conflict and the nature of the recovery environment. This study sought to consider those factors which have the most potential for moderation e.g. through training or debriefing; in order to address the problem of stress prevention. Therefore, since Moran and Britton (1994) found that emergency service workers do not differ from the general population in terms of personality and since personality cannot be easily modified it was decided that personality was not a useful variable to consider in this study, despite the fact that empirically (McFarlane 1989, Thompson et al 1994, Bartone et al 1989) and theoretically (Green et al 1985, Peterson et al 1991) it can be considered an important factor.

Role conflict was also excluded from the study. This was mainly because role conflict is already an issue which Fire and Rescue Service accept and take steps to minimise as far as possible. It was decided that any further empirical support for the role of this factor would be unprofitable, given the number of factors necessary to include. The recovery environment is also an important issue which has both empirical (Wilson et al 1985, Paton et al 1996) and theoretical support (Green et al 1985, Foa et al 1989, Peterson et al 1991). It was decided, however, that this variable should be excluded since all the fire fighters in the study worked in the same organisation and therefore within the same cultural milieu. Critical incident debriefing is also included under the umbrella of the recovery environment, and the evaluation of debriefing would have extended the study beyond reasonable limits.

The other factors identified consistently in the research and theoretical models reviewed above were all included in the study. The single most consistent finding in the literature is that the severity of exposure to the critical incident is related to subsequent distress (Paton et al 1996, Weiss 1995, Werner 1992, Wilkinson 1992, Wilson 1985). Therefore this study predicted that greater exposure to the critical incident would be associated with higher levels of post traumatic stress symptomatology.

Social support has been identified as an important factor both empirically (Solomon et al 1988, Bartone 1989, Gibbs 1993, Jenkins 1997) and theoretically (Green et al 1985, Foa et al 1989, Peterson et al 1991) in the moderation of the stress response. Therefore, this study predicted that social support would be associated with lower levels of stress and higher levels of well-being.

Control expectancies and cognitive appraisal factors have both been found to be important factors (Hartsough 1985, McCammon 1988, Kushner 1992, Weiss 1995, McCammon 1996) and are consistent with the theoretical models (Green et al 1985, Foa et al 1989, Peterson et al 1991). Therefore, the study predicted that lower expectations of controllability and higher threat appraisal would be associated with increased levels of stress symptomatology. Studies have also suggested that appraisal is

associated with coping styles (Soloman 1988). Therefore the study also predicted that appraisal of the incident would be related to the type of coping style employed.

Weiss et al 1995 and Marmar et al 1996 both found that peritraumatic dissociation was associated with higher levels of post traumatic stress symptomatology. Studies also show that avoidant coping strategies used following an incident were associated with post traumatic stress symptomatology. This study sought to replicate both these findings. In addition, it aimed to separate on-scene and post event coping strategies. The rationale behind this was that whilst on-scene there is a job of work to be done which cannot be avoided behaviourally. However, it may be that cognitive avoidance is adaptive in as much as it facilitates the ability of the emergency service worker to carry out the job. Several authors have discussed this (Roth and Cohen 1986, Myers 1995); however, none to the author's knowledge have systematically studied it. Therefore, the study predicted that on-scene cognitive avoidance would not be predictive of post traumatic stress symptomatology whilst extreme cognitive avoidance in terms of peritraumatic dissociation would be maladaptive.

The study sought to build a regression model of the predictive factors in order to explore their relative contribution to post traumatic stress symptomatology, both immediately after the event and at the present time. Finally, the study also sought to build a regression model of the relative contribution of the predictive factors to a positive outcome.

Hypotheses

1. Evidence of PTSD symptomatology and other psychological symptoms will be apparent within a proportion of the Fire Service personnel.
2. The degree of exposure to the specified critical incident will be associated with the level of stress symptoms experienced.
3. High levels of social support will be related to lower levels of Post Traumatic stress symptomatology and other psychological symptoms.
4. Cognitive appraisal of the specified critical incident will be related to the degree of symptomatic distress experienced.
5. Cognitive appraisal of the incident will be related to the type of coping strategies employed during the critical incident.
6. Peritraumatic dissociation during a specified critical incident will be associated with stress symptoms of greater severity.
7. Peritraumatic dissociation will be associated with cognitive avoidance during the specified incident.
8. Cognitive avoidance coping strategies used following the critical incident will be associated with higher levels of post traumatic stress symptomatology.
9. Cognitive avoidance coping strategies used during the specified critical incident will not be associated with higher levels of post traumatic stress symptomatology.

Method

Design

The study was split into two parts. The first and largest part was a questionnaire survey which was designed to be analysed using a multiple regression model. The questionnaire pack was distributed to all of the operational fire fighting personnel within the Fire and Rescue Service (n=380). The questionnaire pack contained measures which divide into three parts:

- Information about the participant, including demographic information and social support.
- Information about an incident the participant was asked to identify, including the severity of exposure, coping during and after the incident, peritraumatic dissociation, and the immediate effects of the incident.
- Information relating to current level of functioning and a social desirability scale.

There were 8 predictive variables to be considered including length of experience, previous personal trauma, social support, severity of exposure to a specified incident, cognitive appraisal, coping during the incident, peritraumatic dissociation and coping after the incident. Outcome measures of post traumatic stress disorder, general health, post traumatic growth and life satisfaction were considered. An a priori power analysis was calculated for a multiple regression with a power of 0.95 an α error of probability of 0.05 and an effect size of 0.15, following convention (Buchner, Erdfelder & Faul 1997, Cohen 1992). This indicated that a total sample size of 160 was necessary.

The second part of the study involved interviews with a small sub-sample of the respondents (n=8) concerned, with the collection of more qualitative data and information concerning general aspects of work stress.

Ethics Committee approval was sought from Lothian Healthcare NHS Trust. Approval was given subject to the condition that a circular was distributed to the General Practitioners in Fife Region to inform them that an anonymous study was taking place. [see Appendix 2 for correspondence with the Ethics Committee.]

Measures

QUESTIONNAIRE STUDY

[See Appendix 3 for Questionnaire Pack]

Demographic Characteristics

Demographic Data collected included age, sex, marital status, number of children, job title, number of years in the fire service, previous occupation (for retained staff current occupation), interests, approximate number of days off sick in the previous year, approximate numbers of cigarettes smoked and units of alcohol consumed on average per week. This section also included items requesting whether (and when) the participant had been involved in a traumatic incident as a victim in the past, whether (and when) the participant had been involved in an incident which necessitated critical incident stress debriefing, as well as the approximate number of personally disturbing incidents the participant had worked at over the last six months.

Social Support

Social Support was assessed using a simple measure developed by McCammon et al in their 1988 study of emergency service responders to an apartment building explosion and a series of tornadoes. The present study adapted the scale to include relevant people for each item, the original scale included family, friends, co-workers and neighbours. In this study participants rated on a 5 point scale (very unsupportive to very supportive) how spouse / partner, family, friends, co-workers and senior staff reacted to their needs.

Identification of A Critical Incident

The participants were asked to identify "one single incident which you have attended as part of your work in the last 2 years, which stands out as one that would usually be very distressing to a member of the general public". The participant was then asked to

write down a brief description of the incident. This question was included in order to focus the participant's mind on one incident whilst completing the rest of the questionnaires. It was worded in this way in order to try to access incidents which were significant but which may or may not have been personally stressful to the participant themselves, in order to obtain a range of stress and coping responses across the sample. In this way it was hoped that good coping responses would be elicited as well as those that reflected poor adaptation.

Severity of Exposure to The Critical Incident

The severity of exposure to the critical incident was assessed using the Critical Incident Exposure Scale (Weiss et al 1995) which was developed for use in a study which compared emergency service responders to the Interstate 800 Freeway collapse in the San Francisco Bay area earthquake and emergency service personnel from the Bay area and San Diego who were not involved. The original scale consists of 30 items scored on a 5 point Likert scale (not at all true to extremely true) with content such as 'I saw dismembered bodies or isolated body parts'. The current study removed four of the original items since in discussion with the Fire service they were deemed inappropriate for this group. These items were (I saw bodies infested by maggots, I saw bodies attacked by rats, I saw evidence bodies had been looted and I was in danger of being robbed or assaulted)

12 items were added to the scale. These were taken from the literature concerning aspects of incidents that had been found to be particularly stressful and were agreed to be appropriate by the Fire service. These included 'There were children or young people involved in the incident', 'I felt unprepared for the incident', 'I identified with or felt an association with the victim/s of the traumatic incident and their family'. The incident was referred to as the 'critical incident' in the original scale, the Fire service believed that the term traumatic was more appropriate for the population since the term critical incident has an official brigade definition for the purposes of critical Incident debriefing and traumatic was deemed by them to be a more acceptable term. The scale is scored as the mean item response across all items and therefore could have a range of 1:00 to 5:00.

The original scale was reported by the authors (Weiss et al 1995) to have a coefficient α of 0.83. Principal components analysis revealed one major factor accounting for 20% of the variance and several smaller factors ranging from 3-8% of the variance with eigenvalues of >1.00 . The authors reported that inspection of the loadings with various rotations suggested sufficient homogeneity to use the total score as a measure of exposure to the incident.

Primary Cognitive Appraisal of The Critical Incident

A brief measure of Cognitive Appraisal was constructed which was loosely based on an unpublished adjective checklist developed by Ferguson and Cox at the University of Nottingham and used by Morgan, Matthews and Winton (1995) in their study of predictors of post traumatic symptomatology in victims of the Perth Flood. The measure consisted of 23 adjectives rated on a 6 point Likert scale (0 = not at all; 5= very much so). The scale was factor analysed using a principal components factor analysis with varimax rotation [see Table 2 for the rotated factor matrix]. Five factors with eigenvalues of greater than 1.0 after rotation were extracted. The scree plot suggested that the first 3 factors were the most significant¹. The factor analysis results permitted identification of cognitive appraisal themes for the fire-fighters. Using a factor loading of >0.5 as the criterion for inclusion of an item on a factor, 10 items loaded significantly on factor 1, 5 items loaded significantly on factor 2, 4 items loaded significantly on factor 3, 4 on factor 4 and 4 on factor 5. Two of the items with a significant loading on factor 2 also loaded significantly on factor 4. One item loaded significantly on both factors 1 and 4. Therefore there is a minimum overlap between factors.

The pattern of the items that had loadings at or above 0.5 on a factor suggested the following interpretation of the factors. Reliability analysis using Cronbach's Alpha of the resultant scales (factors) were also performed and are reported below. Factor 1 suggests appraisal of the incident in a positive manner. The item 'exciting' loaded the highest with a factor loading of 0.872 other items included items such as informative invigorating and thrilling. [see Appendix 4]. Factor 1 revealed a Cronbach's

¹ In order to take account of the scree plot which revealed three factors were most important, a three factor solution should have been carried out.

Coefficient Alpha of 0.9138. Factor 2 suggests appraisal in a more negative way, the item ‘pitiful’ had the highest factor loading (0.822) with other items including disturbing and depressing, this factor was therefore labelled, ‘distressing’. ($\alpha = 0.7773$)

Table 2 -Varimax Rotated Factor Matrix for Primary Cognitive Appraisal

	Factor 1 ‘Positive’	Factor 2 ‘Distressing’	Factor 3 ‘Threatening’	Factor 4 ‘thrill seeking’	Factor 5 ‘challenging’
Threatening			.66406		
Exciting	.87153				
Depressing		.53443			.50460
Informative	.65342				
Pitiful		.82190			
Invigorating	.60116			.56319	
Frightening				.64254	
Thrilling	.70964				
Terrifying				.71547	
Enlivening	.53768			.67287	
Disgusting		.62680			
Challenging					.68269
Disturbing		.79463			
Instructive	.62386				.51436
Intolerable		.62416			
Interesting	.69615				
Fearful			.69209		
Enjoyable	.72369				
Worrying					.56812
Stimulating	.78678				
Dangerous			.60285		
Exhilarating	.82231				
Painful			.58882		

Factor 3 suggests a an appraisal of danger or threat the item that loaded most heavily on this factor was 'threatening' (0.664) and therefore this factor was labelled 'threat appraisal'. ($\alpha = 0.6751$)

The item 'terrifying' loaded most heavily on Factor 4 (0.715) followed by 'enlivening' (0.673) the other two items were invigorating and frightening and therefore this factor was labelled 'thrill seeking'. ($\alpha = 0.7967$)

Factor 5 comprised items 'depressing', 'challenging', 'instructive' and 'worrying' and therefore appeared to suggest a professional attitude to the incident. ($\alpha = 0.6194$) and was labelled challenging.

Secondary Cognitive Appraisal of The Critical Incident

In accordance with the Folkman and Lazarus model of cognitive appraisal and coping a brief measure of secondary appraisal was included. "In secondary appraisal the person evaluates what if anything can be done to overcome or prevent harm or to improve the prospects for benefit" (Folkman et al 1986). The model suggests that primary and secondary appraisal of the situation converges to determine whether it is viewed as primarily threatening or challenging. The measure used was based upon the measure reported in the Folkman and Lazarus (1986) study of the dynamics of a stressful encounter. The measure consisted of 8 statements such as "When you arrived at the incident it was something that you could change or do something about". Subjects indicated on a 6 point Likert scale how much they agreed with each of the statements (0= not at all; 5 = very much so). The items were chosen in accordance with the theoretical model and were worded in consultation with the fire Service senior officers, since any fire situation is one which the Fire Service is strategically equipped to deal with the words 'you personally' were added.

The scale was factor analysed using a principal components factor analysis with varimax rotation [see Table 3 for the rotated factor matrix]. Three factors with eigenvalues of greater than 1.0 after rotation were extracted. The factor analysis results permitted identification of secondary cognitive appraisal themes for the fire-

fighters. Using a factor loading of >0.5 as the criterion for inclusion of an item on a factor, 5 items loaded significantly on Factor 1 [see Table 3], two items loaded significantly on Factor 2 and the last item comprised a factor in itself. None of the items loaded on more than one factor².

Table 3 -Varimax Rotated Factor Matrix for Secondary Cognitive Appraisal

When you arrived at the incident you found it ..	Factor 1	Factor 2	Factor 3
.... was something you could change or do something about by you actions		.786	
.... was a situation where you were unsure of how much influence you could have	.756		
.... was a situation which was going to be just too much for you to cope with personally	.578		
.... was something you just had to accept			.942
.... was a situation in which you needed more information before you could act.	.725		
.... was a situation which was likely to get out of control	.701		
.... Was a in which you felt you had to hold back from doing what you wanted to do	.674		
.... was a situation which you could deal with effectively		.787	

Examination of the item loadings showed that themes could be identified in the responses of the fire-fighters. [See Appendix 5 for reliability analysis of the scales identified] Factor 1 is comprised of items in which the fire-fighter was unsure of how controllable the incident would be, that had the potential to get out of control and in which more information was necessary before the incident could be dealt with ($\alpha =$

² According to convention, a factor should contain three or more items. Therefore, factors 2 and 3 described here have insufficient items to comprise factors in themselves. A two factor solution should have been tested first, though the current analysis may suggest that a single factor solution is sufficient.

0.7150). Factor 2 could be interpreted as appraisal of the incident in a way that was possible to control ($\alpha = 0.4403$). Factor 3 comprised only of the item; "it was a situation which you just had to accept". Inspection of the scree plot suggested that the first two factors were the most significant. Therefore, factor 3 was excluded from all further analyses.

Coping Strategies

No appropriate measure of coping for emergency service workers exists. This study required a coping questionnaire that could discriminate between behavioural and cognitive, avoidance and approach coping strategies. It was also a requirement that it could be used both for on-scene and post event coping. The Coping Responses Inventory (CRI, Moos 1990) was deemed to be the most appropriate measure available, which needed the least amount of adaptation for this population. The Coping Resources Inventory is a 48-item questionnaire based on 8 sub-scales, Cognitive Approach (logical analysis, positive reappraisal) Cognitive Avoidance (cognitive avoidance, acceptance or resignation) Behavioural Approach (seeking guidance or support, taking problem solving action) Behavioural Avoidance (seeking alternative rewards, emotional discharge). The items are rated on a four point Likert scale ('No / Never' to 'a lot/fairly often'). Internal consistency of the sub-scales and test retest reliability over a one year period are reported as satisfactory. The wording of the scale was changed slightly in order to make it more appropriate for the population such that 'the problem' was replaced with the term 'the incident'. The scale is used twice in the study.

On-scene Coping

The scale is first used as a measure of on-scene coping, therefore items that relate to post event coping strategies were removed and replaced with items which appeared to have some face validity for similar meaning in each sub-scale. For example, the item 'Try to learn more things on your own' was a cognitive approach / problem solving strategy and was replaced with the item 'Try to work out the best way to tackle the incident'. [See Appendix 6] One extra item was added to the on-scene coping scale which was 'Try not to think of the casualties as people'. Reliability analyses of the adapted scales were carried out using Cronbach's Alpha scores for each of the sub-

scales were satisfactory. [see Appendix 6] Items that reduced the Alpha score were deleted in further analyses.

Post Event Coping

The post event coping scale was again adapted in a similar way but 17 extra items were added. These items were taken from the literature regarding coping strategies commonly used by emergency service workers and included items such as 'use humour' and 'use critical incident debriefing to analyse the incident'. [See Appendix 3] The questionnaire was analysed for reliability. The results of the reliability analyses are also presented in Appendix 6.

Peritraumatic Dissociation

Peritraumatic Dissociation Experiences Questionnaire, Self Report (PDEQ-SR, Marmar, Weiss, Schlenger, Fairbank, Jordon, Kulka & Hough 1995) yields a single score indexing specific dissociative experiences at the time of the traumatic event, ($\alpha = 0.80$). This is a ten item self report questionnaire which captures self reported dissociation at the time of the incident. For each item the participant rates on a 5 point Likert scale (0 = not at all true; 4= extremely true) the extent to which they experienced altered time sense, depersonalisation, de-realisation, altered body image and related dissociative responses. The PDEQ-SR is scored as a mean item response across all items, therefore scores ranged from 1.00 to 5.00, where scores above the cut-off score of 1.5 were considered to have experienced clinically salient level of peritraumatic dissociation. In the original reporting of the scale in a rater version used with Vietnam veterans the measure showed Cronbach's α of 0.81, it was strongly associated with measure of traumatic stress($r=0.48$) and strongly associated with general dissociative tendencies ($r=.41$, $p<0.001$) and not associated with measures of general psychopathology (mean correlation = -0.06). In a study of emergency service responders (Marmar, et al 1996) principal components factor analysis revealed a single factor with an eigenvalue of 3.43, item to scale correlations and high internal consistency also supported the retention of a single factor to represent peritraumatic dissociation.

General Health Questionnaire -12

The GHQ - 12 (Goldberg, 1978) was used as a short measure of general health. The GHQ method of 0-0-1-1 scoring was used in this study. The GHQ 12 has been found to be a reliable and sensitive measure of psychiatric impairment despite its brevity and is a widely used standardised measure. McFarlane (1989) in a study of fire-fighters in Australia found that a cut off score of 1/2 the GHQ-12 was found to have a specificity of 90%, a sensitivity of 78% and a positive predictive value of 64% for PTSD. Following McFarlane (1989) therefore a cut-off score of 1 / 2 was used.

Post Traumatic Stress Disorder

The Post traumatic Stress Diagnostic Scale (Foa, Riggs, Dancu & Rothbaum, 1993) is a 17 item scale used for diagnosis of post traumatic stress disorder. Items relate to the three main clusters of symptoms, re-experiencing, avoidance and arousal. The scale was originally developed to correspond with DSM-IV criteria for PTSD. Foa et al (1993) investigated the psychometric properties of the scale using a normative sample (n=248) from a wide ranging subject base including patients seeking treatment for PTSD as well as fire fighters, ambulance workers and people from residential rehabilitation centres. Test -retest reliability was assessed, revealing a kappa score of 0.74 and percent agreement of 83.7% indicating a high degree of reliability. Internal consistency of the symptom severity items was measured using Cronbach's Alpha , $\alpha = 0.92$. In this study the word 'incident' was replaced for the word 'traumatic event' for use with the Fire service. The scale was used twice in this study once in its unaltered state as a current measure of post traumatic stress symptomatology. It was also used as a retrospective measure of PTSD symptomatology immediately following the incident and items were added relating to the duration of the symptoms endorsed.

Well-being

The Satisfaction with Life Scale (Deiner, Emmons, Larson and Griffin, 1985) is a measure of the 'cognitive judgmental' component of subjective well-being. It is a five item self report scale in which participants rate on a 7 point Likert scale (strongly disagree to strongly agree) how much they agree with each item. The scale showed a coefficient α of 0.87 and inter item correlations with a mean of .57 in studies carried out by the authors. Factor analyses were carried out on several data sets and these

revealed a single factor accounting for approximately 70% of the variance. This questionnaire was included as a short measure of subjective well-being in the belief that participants may be more inclined to reveal a lack in positive well being whereas they may prefer not to endorse questionnaires which indicate personal difficulties directly.

Positive Outcome

The Post Traumatic Growth Inventory (Tedeschi & Calhoun, 1996) was included to acknowledge that positive outcomes of traumatic experiences are possible, and that people who work in critical occupations are likely to experience some satisfaction from this work. This 21 item self report scale includes 5 factors with eigenvalues of >1.00 which accounted for 62% of the variance; new possibilities, relating to others, personal strength, spiritual change and appreciation of life. Items are scored on a 6 point Likert scale (0 = I did not experience this change as a result of the incident; 5 = I experienced this change to very great degree as a result of this incident) The scale was found to have an internal consistency of $\alpha = 0.90$ and a test retest reliability of $r=0.71$.

Social Desirability

The Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe 1960) was included since the culture of emergency service workers is reported in the literature as one which does not support the disclosure of emotion. Responses may also be influenced by other factors, such as the desire to appear unpeterbed by critical incidents. Therefore, it was felt that a social desirability scale would be a useful addition to the scales in the questionnaire pack. The scale consists of 33 items which are "culturally sanctioned or approved but are of improbable occurrence" (Crowne et al 1960) which are scored on a true false basis by the participant. For example, 'I have never intensely disliked someone'. The scale was found by the authors to have an internal consistency coefficient of $\alpha=0.88$, and a one month test retest reliability of 0.89. The scale correlates with the MMPI Lie scale satisfactorily ($r=0.54$ $p<0.01$).

INTERVIEW STUDY

An interview schedule was constructed [see Appendix 3] in order to gain a more qualitative understanding of the sources of stress and well-being within the day to day work of the fire-fighters. Information was collected pertaining to demographic details, aspects of job satisfaction, aspects of works stress, attitudes towards psychological issues in the fire service, towards the support currently available as well as the nature of what support and or training would be preferred. The interview took approximately one hour to complete. 8 fire fighters in total were interviewed. The small number of participants in this second part of the study and the likely bias of the sample meant that the information provided could not be analysed statistically. However, the results were surprisingly consistent between interviewees and were used in conjunction with information gathered from senior fire service staff to inform the results obtained from the larger questionnaire study.

Participants

Participants were recruited from Fife Fire and Rescue Service. The total population of full time and retained operational fire-fighters were sent a questionnaire, of the 380 questionnaires issued, 137 returned completed or partially completed questionnaires. The response rate was therefore 36%. Volunteers were recruited from the same population. 8 full-time operational staff were interviewed following the questionnaire phase of the study.



Results

The main statistical analytic techniques used were Pearson’s correlations and stepwise multiple regression analyses. All statistics were carried out on the SPSS computer package.

QUESTIONNAIRE STUDY

Table 4 Demographic Characteristics Of Participants (n=137)

	Number	Mean	Standard Deviation	Range	Min	Max
<u>Age</u>	137	36.2	8.17	32	22	54
<u>Experience</u>	137	12.55	8.5	33.8	0.2	34

<u>Gender</u>	male	137
	female	0
<u>Marital Status</u>	married	110
	single	27
	Full time	110
	Retained	27
<u>Rank</u>	Fire fighter	93
	Leading Fire fighter	18
	Sub Officer	11
	Station Officer	14

Hypothesis 1 - Evidence of PTSD symptomatology and other psychological symptoms will be apparent within a proportion of the Fire Service personnel.

Table 5 shows the means, medians, standard deviations and ranges of the measures of symptomatology, as measured by the GHQ-12, and the post traumatic stress disorder scale for current severity of symptoms and severity of symptomatology following the critical incident participants were asked to identify.

Table 5 ~ Descriptive Statistics For Symptomatic Measures (n=137)

	Mean	Median	Standard Deviation	Range
GHQ -12	0.734	0.000	1.191	9
Total number of PTSD symptoms after incident	1.613	1.000	2.303	11
Severity of PTSD symptoms after incident	2.000	1.000	2.993	14
Total number of Current PTSD symptoms	0.602	0.000	1.512	8
Severity of Current PTSD symptoms	0.689	0.000	1.741	8

12.1%³ (n=15) of the sample scored 2 or greater on the GHQ-12, indicating likely psychiatric impairment. Only 2.2% (n=3) fulfilled the symptomatic criteria of Post Traumatic Stress Disorder as reported retrospectively for the time immediately following the event.⁴ However, examination of the frequency tables for the distribution of the number of symptoms reported show that 52.7% (n=49) participants reported having experienced one or more of the symptoms required for diagnosis. 47.31% (n= 44) of the sample reported no psychological symptoms following the event.

Participants also completed the post traumatic stress disorder scale as a current measure of symptomatology. No participants fulfilled the criteria for PTSD. 20.2% (n=24) reported that they were experiencing one or more of the symptoms. 79.8% (n=95) reported that they did not experience any of the symptoms in the PDS scale. Therefore, although the prevalence of post traumatic symptomatology within the sample was low, sufficient variation was deemed to exist for further analyses to be

³ Percentage values reported here are valid percentages excluding missing cases.

⁴ DSM-IV requires that the symptoms have a duration of more than 1 month, however data were not available for the duration of symptoms and therefore these respondents could not be considered to satisfy the criteria for Post Traumatic Stress Disorder

conducted. The results of the study are as expected and show that there is evidence of post traumatic stress symptomatology and other psychological symptoms (as measured by the (GHQ-12) within the fire service.

Table 6 ~ Pearson Correlations Between The Outcome Measures (n=137).

	Severity of PTSD Symptoms after event	Severity of Current PTSD Symptoms	Post Traumatic Growth Inventory	GHQ -12
Severity of Current PTSD Symptoms	0.5257**			
Post Traumatic Growth Inventory	0.3940**	0.1752		
GHQ -12	0.0208	0.2366**	-0.0980	
Life satisfaction	0.0665	-0.0703	0.0427	-0.2645**

* $p < 0.05$ ** $p < 0.01$

Hypothesis 2 ~ The degree of exposure to the specified critical incident will be associated with the level of stress symptoms experienced.

Pearson's correlation coefficients were calculated between the critical incident exposure scale scores and post traumatic stress symptomatology. The correlation coefficient between the severity of exposure to the critical incident specified and post traumatic stress symptomatology immediately following the event was significant. ($r=0.4990$, $p<0.01$). [See table 7] The correlation coefficient between critical incident exposure and current post traumatic stress symptomatology was also significant ($r=0.2826$, $p<0.01$). Therefore the results supported this hypothesis.

Table 7 - Pearson Correlations Between Critical Incident Exposure and Outcome Measures (n=137)

	Severity of PTSD Symptoms after event	Severity of Current PTSD Symptoms	Post Traumatic Growth Inventory	Life Satisfaction	GHQ -12
Critical Incident Exposure	0.4990**	0.2826**	0.3341**	0.0664	0.0891

* p<0.05 ** p<0.01

Hypothesis 3 - High levels of social support will be related to lower levels of Post Traumatic stress symptomatology and other psychological symptoms.

Data were collected on perceived social support received from the Spouse or Partner, Family, Friends, Co-workers and Senior Officers. Since some participants did not have a spouse or partner and because there was some missing data, a mean social support rating was calculated. Two-tailed Pearson's correlation coefficients were calculated between each of the social support ratings and mean social support. Table 8 Shows the Correlation Matrix. It can be seen from the matrix that the social support ratings for each relationship correlated significantly. Each of the individual social support ratings correlated strongly with the mean score for social support (p<0.01).

Table 8 - Pearson Correlation matrix of social support ratings and mean social support (n=137)

	Family	Friends	Senior Officers	Co-workers	Spouse or Partner
Family					
Friends	0.3754**				
Senior Officers	0.3125**	0.4091**			
Co-workers	0.1995*	0.3346**	0.4605**		
Spouse or Partner	0.5798**	0.2683**	0.2724**	0.2155*	
Mean Social Support	0.7226**	0.6677**	0.7399**	0.6991**	0.6576**

* p<0.05 ** p<0.01

Table 9 shows the Pearson correlation matrix for social support ratings and the outcome measures. There is a significant association between mean social support and life satisfaction ($r=0.2888$, $p<0.01$). The results of the correlations between social support ratings and post traumatic stress symptomatology measures were not significant, but did show a trend in the direction expected. Therefore the null hypothesis that social support has no relationship to post traumatic stress symptomatology cannot be rejected.

Social support was related to the life satisfaction scale which suggests that a strong support network of friends and colleagues is one of the factors which are related to general life satisfaction.

Table 9 - Pearson Correlations Between Social Support and Outcome measures (n=137)

	Severity of PTSD Symptoms after event	Severity of Current PTSD Symptoms	GHQ-12	Post Traumatic Growth Inventory	Life satisfaction
Family	-0.1235	-0.0863	-0.1042	0.0014	0.1669
Friends	-0.0491	-0.1409	-0.0328	0.0982	0.0784
Senior Officers	-0.0037	-0.1601	-0.1026	0.0685	0.2392**
Co-workers	0.1232	0.1409	-0.1258	0.0579	0.2942**
Spouse or Partner	-0.1183	-0.0647	-0.2209*	-0.1081	0.2099*
Mean Social Support	-0.0671	-0.0975	-0.1629	0.0205	0.2888**

* $p<0.05$ ** $p<0.01$

Hypothesis 4 - Cognitive appraisal of the specified critical incident will be related to the degree of symptomatic distress experienced.

Pearson’s correlations were calculated between each of the cognitive appraisal factors. Table 10 shows the correlation matrix. The table shows that most of the appraisal factors correlate significantly with each other. Interestingly, positive appraisal correlates does not correlate with appraisal of the event as distressing but does have a

significant association with appraisal of the incident as ‘threatening’ ($r=0.3752$, $p<0.01$); the factor labelled ‘thrill seeking’ ($r=0.5757$, $p<0.01$) and the ‘challenging’ factor ($r=0.4619$, $p<0.01$). Each of the more negative factors correlate significantly together. Examination of the correlations for secondary appraisal in table 10, reveals that feeling in control of the event correlates with positive appraisal ($r=0.3237$, $p<0.01$) and feeling out of control of the situation correlates with the distressing, threatening, thrill seeking and challenging factors of primary appraisal.

Table 11 shows the Pearson correlation coefficients between the appraisal factors and the outcome measures. This shows that the primary appraisal factors labelled distressing ($r=0.3603$, $p<0.01$), threatening ($r=0.4522$, $p<0.01$), thrill seeking ($r=0.2675$, $p<0.01$) and challenging ($r=0.2576$, $p<0.01$) are all significantly associated with increased severity of post traumatic stress symptomatology immediately following the critical incident. Feeling ‘out of control’ also correlates significantly with severity of immediate symptomatology ($r=0.3130$, $p<0.01$).

Positive primary appraisal and feeling ‘in control’ (Secondary appraisal) both show a negative correlation to the severity of post traumatic stress symptomatology although the strength of this association is insignificant. The current severity of post traumatic stress symptomatology shows positive significant correlations with the distressing ($r=0.3004$, $p<0.01$) and threatening ($r=0.2436$, $p<0.05$) factors of primary appraisal. Therefore, it appears that the results are supportive of the hypothesis made.

Post traumatic Growth is associated with all four of the ‘negative appraisal factors and the ‘out of control’ secondary appraisal factor ($p<0.01$).

Hypothesis 5 -Cognitive Appraisal of the incident will be related to the type of coping strategies employed during the critical incident.

Table 11 shows the Pearson correlations between primary and secondary appraisal factors and coping strategies on scene and post event. The positive appraisal factor does not correlate with any of the coping mechanisms, which suggests that coping strategies are employed only once a situation is appraised as stressful.

Table 10 ~ Pearson Correlation matrix for Primary and Secondary Appraisal Factors (n=137)

	Primary Appraisal 1 ~ positive	Primary Appraisal 2 ~ distressing	Primary Appraisal 3 ~ threatening	Primary Appraisal 4 ~ thrill seeking	Primary Appraisal 5 ~ challenging	Secondary Appraisal ~ In control
Primary Appraisal 2 ~ distressing	0.1038					
Primary Appraisal 3 ~ threatening	0.3752**	0.4135**				
Primary Appraisal 4 ~ thrill seeking	0.5757**	0.4150**	0.5325**			
Primary Appraisal 5 ~ challenging	0.4619**	0.5387**	0.4756**	0.4400**		
Secondary Appraisal ~ In control	0.3237**	-0.0675	0.1061	0.0032	0.1775	
Secondary Appraisal ~ Out of control	0.1685	0.2860**	0.3337**	0.3112**	0.3256**	0.1382

* p<0.05 ** p<0.01

Table 11 ~ Pearson Correlation Matrix for Appraisal and Outcome Measures (n=137)

	On Scene Approach	On Scene Avoidance Coping	Post Event Approach Coping	Post Event Avoidance Coping
Primary Appraisal 1 ~ positive	0.1694	0.0585	0.1669	0.1650
Primary Appraisal 2 ~ distressing	0.2442*	0.4297**	0.4426**	0.4569**
Primary Appraisal 3 ~ threatening	0.1660	0.3187**	0.4422**	0.4749**
Primary Appraisal 4 ~ thrill seeking	0.1380	0.3406**	0.3339**	0.3717**
Primary Appraisal 5 ~ challenging	0.3462**	0.2406*	0.4363**	0.4068**
Secondary Appraisal ~ In control	0.3703**	0.0873	0.2551*	0.1254
Secondary Appraisal ~ Out of control	0.2650*	0.4645**	0.2750*	0.2854*

* p<0.05 ** p<0.01

Table 12 ~ Pearson Correlation Matrix for Appraisal and Outcome Measures (n=137)

	Severity of PTSD Symptoms after Event	Current Severity of PTSD Symptoms	PTGI	GHQ-12
Primary Appraisal 1 ~ positive	-0.0757	-0.0131	0.1748	0.0315
Primary Appraisal 2 ~ distressing	0.3603**	0.3004**	0.3958**	-0.0341
Primary Appraisal 3 ~ threatening	0.4522**	0.2436*	0.5603**	-0.0563
Primary Appraisal 4 ~ thrill seeking	0.2675*	0.1371	0.4001**	-0.0124
Primary Appraisal 5 ~ challenging	0.2576*	0.1337	0.4366**	-0.0786
Secondary Appraisal ~ In control	-0.1139	0.0446	0.1078	0.0297
Secondary Appraisal ~ Out of control	0.3130**	0.2066	0.2077	0.1881

* p<0.05 ** p<0.01

On scene approach strategies are correlated with the challenging appraisal ($r=0.3462$, $p<0.01$) factor which suggests that if the critical incident is perceived as a challenge then the individual employs cognitive approach (problem solving or logical analysis) strategies to work out the best way to deal with it. In addition, on-scene avoidance coping is associated with the negative appraisal factors ($p<0.01$). Both approach and avoidance scales after the event are also associated with the negative appraisal factors. Therefore the results clearly support this hypothesis.

Hypothesis 6 - Peritraumatic dissociation during a specified critical incident will be associated with stress symptoms with greater severity.

Table 13 shows the correlations between peritraumatic dissociation and outcome measures. Correlations between peritraumatic dissociation and coping scales are shown in Table 14. As predicted, peritraumatic dissociation correlates significantly with severity of post traumatic stress symptoms experienced immediately after the event ($r=0.5878$, $p<0.01$). Peritraumatic dissociation also correlates significantly with the current level of post traumatic stress symptomatology ($r=0.2313$, $p<0.01$). Therefore the results support the hypothesis.

Table 13- Pearson Correlation Matrix for PDEQSR and Outcome Measures (n=137)

	Severity of PTSD Symptoms after event	Severity of Current PTSD Symptoms	GHQ-12	Post Traumatic Growth Inventory	Life satisfaction
Peritraumatic Dissociation	0.5878**	0.2313*	-0.1159	0.2683**	0.1874

* $p<0.05$ ** $p<0.01$

Hypothesis 7 - Peritraumatic dissociation will be associated with cognitive avoidance during the specified incident.

As predicted, both the on scene cognitive avoidance sub-scale ($r=0.2730$, $p<0.01$) and the on scene cognitive avoidance scale ($r=0.2312$, $p<0.05$) are significantly associated with peritraumatic dissociation. [see Table 14]

Hypothesis 8 - Cognitive avoidance coping strategies used following the critical incident will be associated with higher levels of post traumatic stress symptomatology.

Table 14 shows the relationships between the main coping scales and the outcome measures. As predicted, there was a significant relationship between cognitive avoidance coping used after ($r=0.5311$, $p<0.01$) the critical incident and post traumatic stress symptomatology both immediately following the event and on the current measure of post traumatic stress($r=0.2624$, $p<0.01$). The results of the correlation carried out here were consistent with the Hypothesis.

Table 14 ~ Pearson Correlations Between Coping, Peri-Traumatic Dissociation And Outcome Measures

	<u>PDEQSR</u>	<u>Severity Of Post Traumatic Stress Symptomatology Following CI</u>	<u>Post Traumatic Growth</u>	<u>Current Severity Of Post Traumatic Stress Symptomatology</u>	<u>Life Satisfaction</u>
On Scene Approach Coping	0.0265	0.3654**	0.2803**	0.1376	-0.0222
On-Scene Avoidance Coping	0.2014	0.1455	0.3642**	0.2447*	-0.0456
On Scene Cognitive Approach Coping	0.0758	0.1445	0.2912**	0.1001	0.0313
On Scene Cognitive Avoidance Coping	0.2312*	0.4018**	0.3379**	0.2607*	-0.0883
On Scene Behavioural Approach Coping	-0.0177	0.1220	0.2185*	0.1436	-0.0004
On Scene Behavioural Avoidance Coping	0.0864	0.1864	0.2928**	0.1392	-0.0223
Post Event Approach Coping	0.2530*	0.4531**	0.5945**	0.2242*	0.0917
Post Event Avoidance Coping	0.2612*	0.5325**	0.6318**	0.2267*	0.0435
Post Event Cognitive Approach Coping	0.2743**	0.3908**	0.5680**	0.1932	0.0593
Post Event Cognitive Avoidance Coping	0.2473*	0.5311**	0.5173**	0.2624*	0.0995
Post Event Behavioural Approach Coping	0.1992	0.4520**	0.5409**	0.2235*	0.1127
Post Event Behavioural Avoidance Coping	0.2183*	0.4197**	0.6407**	0.1325	-0.0526

* p<0.05 ** p<0.01

Hypothesis 9 - Cognitive avoidance coping strategies used during the specified critical incident will not be associated with higher levels of post traumatic stress symptomatology

Unexpectedly, cognitive avoidance during the critical incident was significantly associated with post traumatic stress symptomatology immediately after the event ($r=0.4018$, $p<0.01$). The evidence of the results in this study do not support this hypothesis.

Prediction Of Post Traumatic Stress Symptomatology

A stepwise multiple regression was used to evaluate the relative contribution of variables to the prediction of the overall measure of severity of post traumatic stress symptomatology, experienced immediately after the critical incident specified. A preliminary Pearson's correlation matrix of all the possible predictive variables was calculated. [see Appendix 7]. All Factors which correlated significantly were entered into the stepwise multiple regression analysis. The final equation contained eight variables, yielding an multiple R of 0.836, [$F(8,66) = 19.15$, $p<0.001$]. The eight variables contained in the equation were Peri-Traumatic Dissociation, Post Event Behavioural Approach Coping, Severity Of Critical Incident Exposure, Post Event Cognitive Avoidance Coping, Appraisal factor 4 (thrill seeking), Post Event Approach Coping, Secondary Appraisal factor 2 (Out Of Control) and Post Event Coping Through Emotional Discharge. The final equation containing these variables accounted for 66.2% of the variance in the severity of post traumatic stress score. The final regression equation is presented in table 15.

Table 15 Summary Of Multiple Regression To Predict Severity Of Post Traumatic Stress Following The Critical Incident.

	Multiple R	r ²	Adjusted r ²	β	T	Significance
Peri-Traumatic Dissociation	0.616	0.379	0.371	0.655	6.844	0.0000
Post Event Behavioural Approach Coping	0.729	0.532	0.519	1.324	3.361	0.0013
Severity Of Critical Incident Exposure	0.761	0.579	0.561	0.714	2.575	0.0123
Post Event Cognitive Avoidance Coping	0.780	0.610	0.587	0.681	3.813	0.0003
Appraisal 4 - thrill seeking	0.798	0.637	0.610	0.278	-2.340	0.0223
Post Event Approach Coping	0.812	0.660	0.630	1.598	-2.451	0.0169
Secondary Appraisal - Out Of Control	0.827	0.685	0.652	0.287	2.437	0.0175
Post Event Coping Through Emotional Discharge*	0.836	0.699	0.662	1.124	-1.741	0.0864

* final equation

Multiple R, R² and adjusted r² correspond to the step variable was entered on
β, T and Significance of T correspond to final equation figures

Prediction Of Current Post Traumatic Stress Symptomatology

A stepwise multiple regression was used to predict the severity of current post traumatic stress symptomatology. Factors which correlated significantly ($p < 0.01$) were entered into the stepwise multiple regression analysis. Two analyses were carried out; the first included severity of post traumatic stress following the specified critical incident as a covariate. The regression equation contained two variables, severity of PTSD symptomatology at time 1 and age. Together, these variables accounted for 30.3% of the variance in current severity scores. Severity at time one alone accounted for 26.3%. The final equation in this case containing the two variables, yielded a multiple R of 0.521, $[F(2,83) = 19.464, p < 0.001]$. A summary table of the regression model can be found in Table 16.

Table 16 - Summary Of Multiple Regression Model To Predict Severity Of Current Post Traumatic Stress.

	Multiple R	r ²	Adjusted r ²	β	T	Significance
Severity of Post Traumatic Stress Symptomatology at Time 1	0.521	0.272	0.263	0.500	5.499	0.0000
Age*	0.565	0.319	0.303	0.219	2.405	0.0184

* final equation
Multiple R, R² and adjusted r² correspond to the step variable was entered on
β, T and Significance of T correspond to final equation figures

The regression analysis was conducted excluding severity of post traumatic stress from the list of covariates in order to evaluate the relative contribution of the other predictive variables to the current severity score not account for by symptoms at time 1. The final equation in this case contained four variables, severity of exposure to the critical incident, age, previous personal experience of a traumatic incident and post event coping through acceptance or resignation. Together these variables formed the regression equation which yielded a multiple R of 0.471, [F(4,81) = 5.789, p<0.001]. Thereby accounting for 18.4% of the variance in the severity of post traumatic stress score. A summary of the model is presented in table 17.

Table 17 - Summary Of Multiple Regression Model To Predict Severity Of Current Post Traumatic Stress (Excluding post traumatic stress symptomatology at Time 1.)

	Multiple R	r ²	Adjusted r ²	β	T	Significance
Severity of Critical Incident Exposure	0.3045	0.093	0.082	0.185	1.734	0.0868
Age	0.396	0.157	0.137	0.211	2.116	0.0374
Previous Personal Experience of Trauma	0.438	0.192	0.162	0.209	2.058	0.0428
Post Event Coping through Acceptance / Resignation*	0.4715	0.222	0.184	0.187	1.778	0.0792

* final equation

Multiple R, R² and adjusted r² correspond to the step variable was entered on
 β , T and Significance of T correspond to final equation figures

Prediction of Post Traumatic Growth

A stepwise multiple regression analysis was carried out in order to obtain a model for the prediction of post traumatic growth. The summary of the model can be found in Table 18. The final model contains two variables, appraisal of the incident as threatening and post event behavioural avoidance coping strategies. These variables together yielded a multiple R of 0.722, [F(2,79) = 43.062, p<0.001] and accounted for 51% of the variance in the post traumatic growth score.

Table 18 - Summary Of Multiple Regression To Predict Post Traumatic Growth.

	Multiple R	r ²	Adjusted r ²	β	T	Significance
Post Event Behavioural Avoidance Coping	0.667	0.444	0.438	0.667	8.001	0.0000
Appraisal 3 - threatening*	0.722	0.522	0.510	0.307	3.567	0.0006

* final equation

Multiple R, R² and adjusted r² correspond to the step variable was entered on
 β , T and Significance of T correspond to final equation figures

INTERVIEW STUDY

Eight people volunteered for the interview study and all carried out the interview. The emphasis of the interview was on positive aspects of the job and day to day stressors, whereas the emphasis of the questionnaire study focused on a specific serious incident. The demographic characteristics of the interviewees are summarised in Table 19

Table 19 Demographic Characteristics of the Interview Study Participants (n= 8)

Age	Mean	37.375
	Range	30 - 50
Gender	Male	8
	Female	0
Marital Status	Married	8
	Single	0
Length of service	Mean	12.125
	Range	3-26
Rank	Fire Fighter	5
	Leading Fire Fighter	1
	Sub Officer	1
	Station Officer	1

Reasons For Joining The Fire Service

Reasons for joining the fire service varied. Two people reported that variety was an attractive feature of the service. Four of the interviewees reported that job security was the over riding factor, and two more mentioned that they had applied for more than one of the uniformed services. One person reported that the 'thrill' of the job was attractive to him, but that since joining the service had found that his expectations had not been accurate.

Job Satisfaction

The fire fighters were asked how satisfying they found the job. Four of the interviewees reported that they found it satisfying, two reported that they found it very satisfying and two reported that it was satisfying when they were called upon to

do the job that they were trained for. They were then asked “What aspects of the job do you find most satisfying?” Answers to this question had common themes for most of the fire fighters: four specifically mentioned that being able to help people was something they found particularly satisfying; three mentioned they enjoyed providing a service that was looked upon favourably by the general public. Four mentioned that going to fires was satisfying; one interviewee mentioned that using his expertise was important in this respect and one other referred specifically to the ‘adrenaline rush’ involved. Two described the strong bond between members of the watch and one person mentioned the variety in the job.

Personal Gains From Fire Fighting

An open ended question about positive results of fire fighting was posed to all the interviewees. Responses received were varied. Two people felt that their self confidence had increased as a result, two mentioned that they had become more conscientious about safety issues in general, two said that they were now calmer in stressful situations and were less liable to panic. One person mentioned that they had become more disciplined and another person mentioned that they had developed in practical skills and knowledge. Two people described seeing different aspects of society and two more mentioned that they appreciated their own lives more since joining the service.

Preparation For Stressful Aspects Of Fire Fighting

Interviewees were asked “How well do you feel the fire service prepare you for the stressful aspects of the job?”. Five of the interviewees said that their training had not prepared them for the stressful aspects of the job. Only one of the eight people interviewed felt that his training had prepared him adequately for the stressful aspects of the job. One said he felt they did relatively well in training but felt that more could be done. Four felt that more could be achieved through training to prepare fire - fighters for the stressful impact of the job. Suggestions given were to use videos and photographs of real fire and road traffic accident situations in training and to train fire fighters in recognition and management of stress. However, two of the fire fighters felt that little could be done to prepare people for the most stressful aspects of the job, such as seeing a dead body for the first time.

Support for the Stressful Aspects of Fire Fighting

The interviewees were then asked a series of open ended questions pertaining to the level of support that they perceived to be available within the service for the personal impact of fire fighting. Three reported that it was generally accepted that there were personal effects of fire fighting, three felt that it was not generally accepted and two were unsure. When questioned further about what was available and what they felt should be available; all the fire fighters felt that there was a general 'macho' attitude in the fire service which made it difficult to discuss the emotional impacts of the job. However, there was a general feeling that older fire fighters were more entrenched in this attitude than the younger ones. Stress is perceived as a personal weakness, and a person who is not coping is often seen as a liability to the watch, many of the respondents noted that this was a strong dis-incentive to seek support among the watch. One person noted that it was important for newly recruited fire fighters to gain the respect of the watch, and therefore were unable to discuss their feelings. On most shifts they reported that there was an informal jigsawing or debriefing session following the more serious incidents. During this informal debriefing fire fighters tend to go over the operational aspects of the job and in this context some emotional discussion could take place. However, they felt that black humour was the predominant strategy utilised. One fire fighter noted that in one situation, where the Officer in charge believed that keeping busy was the best way of dealing with the effect of an incident they had just returned from, put everyone to work, cleaning and checking the equipment. This apparently created bad feeling within the watch towards the OIC.

Six of the eight fire fighters had attended a critical incident debriefing session. It is perhaps telling that the colloquialism for the Debriefing team in the Brigade is the Cuddle Club. Of the six, none reported that the debrief had been particularly helpful. Several reasons were put forward for this, in one case the team attended some time after the incident and the shift felt they had already dealt with the incident in question, others mentioned that people did not trust the level of confidentiality that the team offered, one person mentioned that it was difficult for people to speak about

their feelings in front of the whole watch and therefore people tended to talk as little as possible, other mentioned that there were personalities on the team that were not respected. Four of the fire fighters noted that it was the Officer in Charge's responsibility to request a critical incident debrief. They felt that this was not an effective strategy. Since some watch officers favour debriefing and others do not the fire fighters felt that debriefing may not be requested when some members of the watch might benefit. One person also mentioned that the OIC himself may need debriefing and may not be in a position to recognise it.

Generally, it was believed that it is currently the watch officer's responsibility to identify and take action on behalf of anyone who requires particular support. However, several of the interviewees noted that the watch officers had no special training in this aspect of their job. Therefore, in general, they felt that the system was too idiosyncratic to be effective.

Suggestions for what support might be useful included: easy access to confidential 1:1 debriefing, access to an external counsellor / psychologist who has knowledge of emergency service work. The overriding impression was of the need for confidentiality. Easy access to support is necessary to obviate the need to involve the watch officer, senior staff or the occupational health staff, since fear of the repercussions on the fire fighter's career through seeking support is a strong deterrent to. Respondents also suggested that clarification of the watch officers role in identifying and providing or accessing support for new recruits and people who become stressed is needed. Many of the respondents also felt that the watch officers should be given specific training in identifying and providing support. In house, informal debriefing sessions were overwhelmingly the most preferred method of averting stress reactions before they take hold. Therefore, some of the respondents suggested that an operational informal debriefing session which provided opportunity to discuss the personal impact of the incident following more serious incidents was the most important measure that could be taken. It was suggested then, that all watch officers could be trained and encouraged to carry out an informal debriefing session after difficult incidents.

Cumulative Stress And Coping

The fire fighters were asked “ In what ways do you feel that greater experience has changed the way you cope with stressful aspects of the job?” The responses for this part of the interview were unclear. One interviewee said that experience lead him to be able to mentally prepare himself for what may happen before arrival at an incident. The interviewees who were qualified as appliance drivers noted that when they were working in their capacity as a driver they became more stressed; partly because they had the added responsibility of getting the team to the incident and partly because they had less time to mentally prepare themselves for the incident, whilst driving to it. Two interviewees note that each incident allowed them to accumulate knowledge about ways of working and ability to mentally prepare themselves for the incident. One interviewee noted that prior to joining the fire service he had suffered from a blood phobia which he had overcome in the course of his work. One other felt that going to several incidents in a short space of time was less stressful since there would be a desensitisation effect, whereas an occasional incident was difficult each time. However, one interviewee believed that experience does not afford greater protection from stress. Two interviewees noted that there may be a breaking point for stress, where they would be able to cope but that a particularly difficult incident, several incidents in short succession or stressful life events outside work may be enough to cause difficulties.

Discussion

Implications and Interpretation of Results

The ecosystemic model proposed by Peterson and Prout (1991) combines the most important aspects of several models (Horowitz 1979, Green et al 1985, Janoff-Bullman 1989) to providing a comprehensive understanding of PTSD. The main components of the model have been supported by the literature to date. The results of this study can also be understood in these terms.

Hypothesis 1 -Evidence of PTSD symptomatology and other psychological symptoms will be apparent within a proportion of the Fire Service personnel.

Although, the prevalence of psychological symptoms was low and no participants fulfilled the diagnostic criteria for post traumatic stress disorder, these results are as expected. Most studies of emergency service traumatic stress have used the Impact of Event Scale (Horowitz et al 1979). The RIES however, only measures the intrusion and avoidance clusters of the disorder. Little work has been carried out on the psychometric properties of the IES, beyond that underpinning its development. These properties were established using a restricted clinical population and its subsequent use has transcended the population it was originally developed for. Smith and Paton (1997) carried out a structural assessment of the scale, using a cluster analysis and multi-dimensional scaling; they found that it had considerable between sample differences in relation to both scale content and the structural relations between items. After careful consideration it was decided that the Post traumatic Stress Diagnostic Scale (Foa et al 1995) would be a more reliable measure. Paton & Smith (1996) present norms on the IES for fire fighters working in Scotland (mean=4.04), Australia (14.4) and Japan (5.11). These figures show that fire fighters experience some symptoms (i.e.>0). However, the cut off score is ≥ 20 , therefore, it is clear that clinically meaningful levels of post traumatic stress symptoms are not reported. It appears that the level of post traumatic symptomatology in this population is consistent with that reported elsewhere. In addition, it must be remembered that those fire fighters who would have reported clinically meaningful levels of post

traumatic stress disorder are most likely to be off work and therefore would not have received the questionnaire pack.

Hypothesis 2 - The degree of exposure to the specified critical incident will be associated with the level of stress symptoms experienced.

The relationship between severity of exposure to the critical incident and post traumatic stress symptomatology finding in the literature. The results of this study showed that emergency service workers are not immune to these effects. The ecosystemic model (which subsumes schematic and cognitive theories) of PTSD suggest that an event which is outside the realm of normal experience cannot be assimilated into pre-existing cognitive schemata. Schemata are constructed from experience and therefore will vary between individuals. From this perspective, it would be reasonable to assume that the emergency service worker's schemata can accommodate a wider range of traumatic stimuli than the general population given their training and wide ranging experience of critical incidents. However, the results showed that, extreme events outside the realm of their experience can still precipitate post traumatic stress symptomatology.

Hypothesis 3 - High levels of social support will be related to lower levels of Post Traumatic stress symptomatology and other psychological symptoms.

Models of post traumatic stress disorder subsume social support under the variables included in the recovery environment and therefore consider social support to be a mitigating factor following exposure the critical incident. Most of the correlations between social support and symptomatology were in the direction expected; however they did not reach significant levels. This may be because the questionnaire pack included social support in the section under demographic variables. This meant that social support ratings were not made in relation to the critical incident specified or in relation to the coping or stress measures after the event. Therefore the ratings may represent general support available, rather than that which was received in relation to the critical incident specified.

Hypothesis 4 - Cognitive appraisal of the specified critical incident will be related to the degree of symptomatic distress experienced.

The ecosystemic and schematic models of PTSD suggest that when the incident is appraised as threatening or distressing post traumatic stress disorder is more likely to result. Indeed the DSM-IV criteria for PTSD now requires that the incident must have involved actual or threatened death or serious injury (to self or others) or that it involved intense fear helplessness or horror. Therefore, rather than an objective measure of severity, the person's appraisal of the incident is afforded a high degree of importance. The results of this study are consistent with this understanding of the disorder.

The results showed that both Primary and Secondary appraisal scores were significantly related to post traumatic stress symptomatology at time 1 and time 2. In addition, positive primary and secondary appraisal showed a negative non significant trend towards post traumatic stress symptomatology. Therefore the results clearly support the view that cognitive appraisal is an important factor in the aetiology of PTSD.

Hypothesis 5 - Cognitive Appraisal of the incident will be related to the type of coping strategies employed during the critical incident.

Further to the previous finding, Hypothesis 5 suggested that cognitive appraisal of the incident would be related to the type of coping mechanisms employed during and after the critical incident. The results showed that appraisal of the incident as challenging (primary) but controllable (secondary) was related to approach styles of coping. That is, the fire-fighters used strategies such as problem solving etc. when the critical incident could potentially be effectively managed. However, in critical incidents which were uncontrollable and threatening or distressing, they tended to use avoidance styles of coping during the incident and used all types of coping following the incident. Therefore, these results were consistent with the hypothesis and with the cognitive appraisal / schema theory accounts of PTSD (Horowitz 1986, Epstein 1990, Green et al 1985, Peterson and Prout 1991) and with previous

empirical evidence (McCammon, Durham, Jackson & Williamson 1988, Hartsough, 1985, McCammon 1996).

Hypothesis 6 - Peritraumatic dissociation during a specified critical incident will be associated with stress symptoms with greater severity.

Peritraumatic dissociation was associated with increased post traumatic stress symptomatology, which supports this hypothesis. This finding is consistent with those of Marmar et al (1996) and Weiss et al (1995) who have found that peritraumatic dissociation was the single most predictive factor for PTSD.

Hypothesis 7 - Peritraumatic dissociation will be associated with cognitive avoidance during the specified incident.

Peritraumatic dissociation was strongly associated with cognitive avoidance coping whilst the fire-fighters were on scene. This is consistent with the view that dissociation during an event can be likened to an extreme form of cognitive avoidance. In addition, there was support for an association between peritraumatic dissociation and increased coping strategies of both types, approach and avoidance after the critical incident. This appears to be consistent with the findings above that negative appraisal of the incident was associated with increase coping of all types after the event. McCammon et al (1987) who found that emergency service personnel generally employed more coping strategies following two major disasters in the same area. Spurrell and McFarlane (1993) also found similar results which they conclude represent an attempt to “contain the distress caused by symptoms”. Roth and Cohen (1986) in their discussion of coping strategies suggest that an increase in all types of coping may be the most adaptive way of dealing with extreme distress. Therefore the results may represent an attempt by the fire fighters to deal with their post traumatic stress symptomatology.

Hypothesis 8 - Cognitive avoidance coping strategies used following the critical incident will be associated with higher levels of post traumatic stress symptomatology.

The results showed that cognitive avoidance coping strategies used after the incident were associated with increased symptomatology. The results therefore supported this hypothesis. However, the results also showed that approach styles of coping was associated with increased post traumatic stress symptomatology. Therefore, it appears that there is a general increase in coping strategies following a stressful incident.

Hypothesis 9 - Cognitive avoidance coping strategies used during the specified critical incident will not be associated with higher levels of post traumatic stress symptomatology.

This hypothesis suggested that although peritraumatic dissociation appears to be maladaptive, cognitive avoidance in its less extreme sense may facilitate behavioural approach during the fire-fighters response to a critical incident. The results showed that cognitive avoidance was related to increased symptomatology, but that cognitive avoidance was not an important factor in the prediction of post traumatic stress symptomatology (using regression analyses). Therefore, although the results are not directly supportive of the hypothesis, they may still be consistent with the formulation behind it.

Roth and Cohen (1986) note that there are advantages and disadvantages of both approach and avoidance strategies of coping. Thinking about the “threatening material can lead to increase [emotional] distress” Secondly as they note when there is no way to change the situation or there is no time for emotional assimilation of the threat, approach can lead to worrying which is “time consuming and non productive. However the fire fighter has no choice but to approach the situation (behaviourally) in order to carry out his job, Therefore cognitive avoidance strategies may allow this to happen whilst affording them some degree of protection from the emotional impact of the critical incident whilst it is continuing. As Myers (1995) notes there is a “professional necessity to deny and suppress feelings in order to function under highly stressful circumstances”. However, the disadvantage of cognitive avoidance is that it leads to higher emotional distress following the event at which time a range of coping mechanisms can be productively employed. Roth and Cohen suggest that using both approach and avoidance coping strategies will be the most adaptive way to

overcome distress. This is consistent with the Horowitz model of PTSD which suggests that both approach and avoidance strategies are necessary in order to allow the gradual assimilation of traumatic experiences into pre-existing schemata. The results, therefore would be consistent with these formulations

PREDICTION OF POSITIVE AND PATHOLOGICAL OUTCOMES

Prediction Of Post Traumatic Stress Symptomatology At Time 1

The model constructed for the prediction of post traumatic stress symptomatology immediately following the event contained eight variables, accounting for 66.2% of the variance. In accordance with the ecosystemic model of PTSD the regression equation showed that objective severity of the incident and subjective appraisal of the incident as uncontrollable were important. In addition, peritraumatic dissociation accounted for 37% of the variance. Following the incident an increase in cognitive avoidance coping styles were predictive of the symptomatology as was behaviour approach strategies. This may reflect the individuals attempts to contain distress through avoidance, thereby decreasing arousal, fluctuating with attempts to do something to overcome the symptoms.

Appraisal of the incident in a way that is exciting as well as frightening mitigated against post traumatic stress symptomatology. This 'thrill seeking' appraisal factor may represent the fire fighters attitudes towards critical incidents as exciting, whilst retain a healthy respect for the serious nature, which many of the interviewees described. Following the incident approach coping strategies and the discharge of emotion also mitigated against post traumatic stress symptomatology. Therefore, the results of the regression model appear to be consistent with the findings above and with current theoretical understanding of PTSD and traumatic stress in critical occupations.

Prediction Of Post Traumatic Stress Symptomatology At Time 2

The regression models constructed for current stress symptomatology accounts for a smaller proportion of the variance. However this is to be expected since some time has elapsed between the predictor variables and the outcome variable (participants were

required to identify an incident within the last two years). In the first model which includes stress immediately after the event as a covariate, this covariate alone predicts $\approx 26\%$ of the variance. It appears that the evidence of post traumatic stress symptomatology in the past is the most predictive factor for stress in the present. Although this is not a direct relationship, it appears that individuals who experience post traumatic stress symptomatology following a severe critical incident are at an elevated risk of negative psychological effects in the long term. This finding emphasises the importance of addressing stress symptomatology early, before it becomes a chronic problem.

The second regression model excluding stress symptoms (at time 1) from the list of covariates, shows that the objective measure of severity of exposure to the critical incident, age, previous experience of a personal traumatic incident and post event coping through acceptance or resignation together accounted for 18.4% of the variance of current post traumatic stress symptoms. Acceptance or resignation coping strategies are part of the cognitive avoidance scale of coping. The model therefore shows that exposure to a severe event and the use of cognitive avoidance coping strategies after the event predict traumatic stress in the long term. In addition, it shows that age and a personal experience of a traumatic incident are also predictive. It may be that age is predictive since there is a greater likelihood of having experienced an extreme event. In addition, older fire fighters may constitute a separate cohort, i.e. several of the fire fighters in interview suggested that the macho image was more strongly associated with their older counterparts. It may be therefore that avoidance styles of coping are more common in this age group.

McFarlane (1989) in his study of Australian bushfire fighters also found that personal traumatic incidents were predictive of symptomatology at 29 months, (explaining 29% of the variance). He interpreted this as showing that adverse life events tend to play a part in the maintenance of post traumatic stress reactions rather in precipitating them, which may be an explanation for the predictive nature of a personal traumatic experience.

The regression model for post traumatic growth is interesting. It had been expected that positive factors such as adaptive coping, appraising the incident in a positive way, etc. would be related to this factor. However, this was not the case. It is possible that because participants rated the questionnaires based on a traumatic incident, only incidents which created distress at the time were included in the study, although this was not the intention. This point is discussed in more detail below. The regression model showed that two factors were important, avoidance coping following the event and appraisal of the incident as threatening. It appears therefore that successful 'mastery' over a difficult incident predicted the greatest amount of post traumatic growth, in short the incident had to be appraised as traumatic before growth occurred.

It is difficult to explain why avoidance coping might have predicted post traumatic growth since it is usually associated with negative outcome. Possible explanations could be that in this instance avoidance is adaptive since fire fighters do not have the luxury of time to dwell on incidents it is possible that avoidance strategies do not equal denial in this group. As Moran (1998) notes forgetting can help a person cope because it can reduce arousal. An alternative explanation may be that since only 30% of the variance was accounted for by these two factors, some other variables/s may have played a significant part in effecting a positive outcome.

SUMMARY OF DISCUSSION OF RESULTS

To summarise, the results obtained in the study support the ecosystemic model of post traumatic stress disorder. They suggest that in the first instance cognitive appraisal of the incident and the objective severity of the incident are important. These appear to influence the type of coping mechanisms that are employed. There is a suggestion that cognitive avoidance on-scene may facilitate effective performance of rescue work, but that it has immediate costs in terms of traumatic stress reactivity. However, the timely use of approach and avoidance mechanisms of coping appear to facilitate the rapid resolution of those stress symptoms. Peritraumatic dissociation is an important factor in the immediate onset of post traumatic stress symptomatology but this does not preclude post traumatic growth. The results are consistent with the cognitive,

schematic and ecosystemic models of post traumatic stress disorder. In addition the results show that factors which have been shown to be important in large urban emergency service units responding to major disasters, are also important in fire-fighters working in a relatively small service working within a largely rural area during the course of routine operations.

Discussion of methodology

DESIGN DIFFICULTIES

The primary difficulty with the study concerns the nature of the design. The design involved the use of self report questionnaire data for all measures taken at one point in time from a single group of fire fighters. Several difficulties are encountered through such a design. Firstly, in order to distinguish between the factors which predispose, precipitate and mediate (or mitigate) the negative psychological reactions to traumatic exposure, a longitudinal or developmental experimental design would be necessary. The multiple regression model using self report measures cannot distinguish statistically between these factors and therefore interpretation of the results must take this into account. Any interpretation of the timing and nature of the relationship between the predictive variables and the outcome measures can only be made from a theoretical standpoint. The study reported here was carried out using this design simply due to the time and resource constraints inherent in the D.Clin. Psychol. dissertation.

Secondly, it is important to recognise that since the measures were all taken at a single point in time there may have been a tendency for participants to strive for consistency in their responses, which can be a particular problem in retrospective self report questionnaires. However, Norris and Kaniasty (1992) carried out a study to consider the reliability of delayed self reports in disaster research and found that in a civilian population there was very good agreement over a months interval, between scores of loss in the disaster, preparedness for it and social support received at the time. Although the study was carried out within a civilian population it does lend some support to the credibility of retrospective reporting in traumatic stress research. Theoretically, one would expect retrospective reports to be quite accurate given that

intrusive memories of the incident play such an important role in post traumatic stress disorder.

There may also have been a tendency for participants to make socially desirable responses. This is a particular difficulty in a population which is well known for under reporting negative emotional effects of their work. In an attempt to quantify this effect, a measure of socially desirable responding was included in the questionnaire pack. The results showed that socially desirable responding was significantly correlated with current measures of life satisfaction ($r=0.2517$, $p<0.01$) and post traumatic stress symptomatology ($r=-0.2572$, $p<0.01$). However, it was not significantly associated with the GHQ-12 or post traumatic stress symptomatology, at Time 1. Therefore, participants may have felt that it was more acceptable to report symptoms following a traumatic event that occurred in the past, than currently.

Participants were drawn from a single source, i.e. Fife Fire and Rescue service. Therefore, the results taken from the study of this group may not be representative of fire fighters in general, particularly since the Fife brigade is relatively small and covers a largely rural area of Scotland. However, although this is true, part of the purpose of the study was to explore whether the findings of studies of emergency service workers responding to major disasters, could be replicated in fire fighters in a small rural brigade, during the course of their normal work. If time and resources had allowed, it would have been beneficial to include more than one brigade, to overcome this difficulty. In addition, it would also be beneficial to consider different occupational groups (police, paramedics, mountain rescue workers, etc.) in order to isolate the factors which consistently affect reactions to critical incident exposure.

DIFFICULTIES WITH MEASURES

A major difficulty in critical occupation traumatic stress research generally, is concerned with the lack of consistency in the measures used. Typically, the RIES (Horowitz 1979) is used as a measure of symptomatology; however as discussed earlier it suffers from significant psychometric flaws. No other measure is consistently

used which means that there is a lack of normative data in occupational stress for comparison purposes.

There is also a paucity of good coping measures which are appropriate for use with this population. De Ridder (1996) presents a review of conceptual and methodological issues in coping assessment. As De Ridder points out, different theoreticians have conceptualised coping in different ways. The Folkman and Lazarus model proposes a distinction between problem focused and emotion focused coping. However, several other assessments use approach vs. avoidance coping categories (e.g. Moos & Billings 1982). De Ridder argues that the conceptualisation of coping needs to be clarified before adequate measures can be constructed. In addition, he notes that coping assessment assumes that people are able to retrieve and verbalise past coping efforts, therefore the extent to which retrospective assessment of coping affects the validity of the responses is unknown. It is also unclear to what extent people actually are able to "reflect upon their attempts to deal with adverse conditions and to what extent they are forced to reconstruct these attempts [in a socially acceptable manner]" (De Ridder 1996). All these difficulties are, of course, relevant to this study.

DIFFICULTIES WITH MISSING DATA

It was necessary, as discussed in the methods section, to request participants to identify a single incident to base their other responses on. An attempt was made to elicit significant incidents which ranged in severity of exposure and in the effects that were reported. However, it appears from a perusal of the raw data that participants tended to either identify an incident that they found traumatic or did not identify an incident at all. Therefore there was a significant amount of missing data. This probably had a significant effect on the results obtained. However it is difficult to hypothesise what effect this may have had.

In addition, the response rate to the questionnaire was 36%. This raises the question of how representative the sample may have been of the population. It may be that those people who did not return the questionnaire, or who did not complete the questionnaire, believed it was not relevant to them. This may represent a denial of negative psychological effects of the work, indicating that the results underestimate

the degree of significance of the problem of stress in the fire service. Alternatively, it may also represent a justified true belief that traumatic stress is not a significant problem for the fire service. Without any knowledge of the group who did not reply there is no way to determine which of these is closer to the truth.

The size of the sample who returned the questionnaire was 137. Although this approaches the number that would be necessary for a reliable multiple regression analysis to be performed, there was a significant problem of missing data within the returned questionnaires. Therefore, the multiple regression analyses were based on limited numbers (66-81) which must be taken into account when interpreting the data. In order to maximise the sample size, questionnaires were distributed to both full time and retained fire fighters. However, the analyses assumed that these groups were equivalent. This may not have been a valid assumption. Further analyses would be necessary to clarify this point which time constraints prevented. However, future research would benefit from comparing the effects of traumatic exposure in these groups.

Pearson's correlations were reported in order to maintain consistency within the analyses, since multiple regression employs this method. However, the outcome data was skewed towards zero, i.e. the majority of respondents had few negative psychological effects of exposure. Spearman's correlations were also calculated (not reported) which showed very similar results to those reported.

In addition, all of the factors which correlated significantly with the outcome measures were entered into the regression models. However there was a significant amount of overlap between some of these measures. The coping scales are made up of different levels of scales, therefore smaller sub-scales are subsumed within larger scales. However, since there was no way of knowing which factors may be important all of the measures that correlated significantly were entered.

FUTURE RESEARCH RECOMMENDATIONS

Further empirical knowledge is needed in order to develop understanding of emergency service worker's positive and negative reactivity to critical incident

exposure both in disaster situations and during routine operations. Prevention of negative psychological effects of exposure is of paramount importance in emergency service work, since traumatic stress symptomatology exacts substantial costs on individuals, the organisations they work for and ultimately, the society they serve. In order to develop effective preventative interventions, greater knowledge regarding the path towards positive and pathological outcome is necessary. This requires the use of prospective longitudinal studies of a range of emergency service professions both during routine operations and in disaster situations. Although it is important to understand the mechanisms through which difficulties arise it is also particularly important to understand how positive outcomes result. Currently there is very little research into positive outcomes.

It will be necessary to gain a broader base of knowledge regarding the normative levels of traumatic stress symptomatology for comparison between groups and across situations. In order to achieve this, good reliable and valid assessment measures must be made available. Currently researchers are relying on a range of assessment measures which provide very little scope for comparison of research findings.

In order to develop effective training programs which aim to broaden emergency service worker's professional schemata further knowledge is necessary concerning what elements programs should include. It is therefore important to have a greater understanding of the elements of critical incidents which are likely to cause distress, what measures can be taken to minimise that distress before the event, and what the most effective mechanisms for containing the distress that does arise are. Research on positive outcomes could provide the key to explain which factors interact to promote well-being and minimise distress. Currently, for example there is a paucity of reliable and valid measures of both outcome and coping mechanisms. A solution focused approach could be the most effective manner in which to achieve the aims of traumatic stress research; namely the promotion of well-being and the reduction of post traumatic stress.

This study has attempted to separate primary and secondary appraisal and coping on-scene and post event. To the authors knowledge very few studies have attempted to do

this and fewer have considered the effects of these on outcome. Some interesting findings emerged which are consistent with the theoretical understanding of traumatic stress in critical occupations. Further research using a prospective design would be important to confirm these findings.

In addition, there must be further research into the evaluation of training, support and debriefing programs. For example, currently very few methodologically sound studies of Critical incident debriefing have taken place. It is unfortunate that CISD has become so common place and accepted, before proper evaluation has proven its effectiveness. Provision of strategies which are ineffective at best, harmful at worst, is dangerous both to the individuals that partake, and to the future success of the credibility of those researchers and clinicians who seek to promote well-being and prevent traumatic stress reactions in emergency service work and the interventions they propose.

Prevention of Traumatic Stress

It is evident from this and other studies reviewed above that exposure to critical incidents during the course of routine work can have a detrimental effect on the psychological well-being of emergency service workers. This, therefore, leads to the question of prevention of traumatic stress reactions.

CRITICAL INCIDENT STRESS DEBRIEFING

Critical incident stress debriefing (Mitchell 1988, Dyregrov 1989, etc.) has often been referred to as a preventative intervention. However, debriefing aims to reduce or prevent stress reactions only after exposure to a critical incident. As Paton, Smith & Stephens (1998) note this approach tends to assume that traumatic stress reactions are an inevitable consequence of critical incident exposure.

Critical incident stress debriefing (CISD) aims to encourage disclosure of emotional reactions to critical incidents in a socially supportive environment, normalise these reactions and facilitate cognitive processing (Moran 1998). Exponents of CISD maintain that it significantly reduces post traumatic stress symptomatology. Research

studies show that emergency service worker's generally appreciate and value the intervention (Kenardy 1998, Moran 1998). However, the evidence is more equivocal in its aims to reduce stress reactions. Kenardy (1998) reported that in a study he and others recently carried out, there was no relationship between perceived helpfulness of CISD, rated by the victims of the Newcastle, Australia earthquake, and their traumatic stress symptomatology. Several studies have recently emerged that suggest that CISD is as good as (but no better than) no intervention (Hyttén and Hasle 1989, Stephens 1996, Deahl et al 1994, Kenardy et al 1998) and others conclude that CISD may actually increase post traumatic stress symptomatology (McFarlane 1988, Bisson et al 1997, etc.) These findings suggest that more research is necessary before CISD can be shown to be as effective as it has previously been thought.

In order to minimise potential for harm certain suggestions can be drawn from the research literature and from the emergency service worker's experience taken from the interview study. It has been suggested that debriefing could produce harmful effects in those people who are not ready to work through traumatic memories or those who generally cope effectively through avoidance. Therefore, it is important that CISD is a voluntary activity so that people are not forced to expose themselves to memories that may be harmful. Some participants have reported that confidentiality is not trusted and therefore as much care as possible must be taken by those facilitating the debrief, to ensure confidentiality is assured and provided. In addition, one of the effective components of CISD may be in its ability to enhance already existent social support within the group (Stephens 1997, Foa et al 1989) and the process should therefore capitalise on this aspect of the debrief.

Paton et al (1998) note that most of literature to date has focused on debriefing as the primary form of prevention of traumatic stress reactions; however this has diverted attention away from interventions which have the potential to prevent or minimise stress reactions prior to exposure. Green (1995) proposed that prevention could be considered at two levels; the primary and the secondary. Primary prevention can be considered as those interventions which aim to prevent stress reactions before or independent of a particular traumatic incident e.g. training or education. Secondary

prevention interventions are those which aim to prevent stress reactions following a traumatic incident (e.g. CISD, defusing, individual counselling).

PRIMARY PREVENTION OF POST TRAUMATIC STRESS SYMPTOMATOLOGY

Implications Of Risk Factors

Certain factors which tend to increase the risk of post traumatic stress reactions in emergency service workers have been identified in the studies reviewed earlier. To summarise, the most consistently recognised 'risk factors' in the literature are personality variables, social support, control expectancies, the severity of the incident, role conflict, cognitive appraisal of the incident, peritraumatic dissociation, coping styles, and the nature of the recovery environment. This study also found that cognitive appraisal, the severity of exposure to the critical incident, peritraumatic dissociation, and coping mechanisms were important factors accounting for a substantial amount of the variance in post traumatic stress symptomatology. Preventive intervention strategies can take advantage of the implications of the 'risk factors'.

Personality Variables - The issue of personality variables as risk factors has implicated the possibility of screening individuals for emergency service work (Paton et al 1996, McCammon 1996). However, as Moran (1998) notes the evidence to date is not sufficiently clear to determine which personality factors are associated with a low propensity towards PTSD. In addition, she notes that currently psychological screening instruments do not possess sufficient predictive validity to be useful in this context. Paton (1996) argues that an approach based on the assumption that high risk individuals could be screened out is likely to restrict attempts to explore other relevant variables and avenues for stress prevention. The active screening out of individuals is likely therefore, to be less than completely effective and may cause emergency services to reduce their attempts to consider alternatives.

Social Support & Recovery Environment - Individuals gain their support from a variety of sources; co-workers, senior staff as well as friends and family. It must be noted that social support is a multidimensional construct (Paton 1996), including e.g.

informational support, tangible support, emotional support esteem support and group belonging support. Gibbs (1993) notes that several interventions have involved techniques to increase social support e.g. by involving worker's families. One important dimension of CISD is to strengthen the support aspects of the emergency team. The emergency team is a strong cohesive unit which is influenced by the cultural norms of the organisation. These cultural norms will therefore, have a strong influence on the support available to individuals within the team. The absence of a sense of belonging to this unit may significantly exacerbate an individuals psychological distress. It has been noted by several clinicians and researchers as well as the fire fighters within this study themselves, that the culture of the emergency service does not generally endorse emotional reactions to critical incidents. This implies that in order to encourage disclosure and increase support availability, the culture of the organisation itself must be targeted through education of the normative nature of stress reactions to extreme situations. In this way early emotional disclosure in a socially supportive environment, could contain stress reactivity before it becomes chronically pathological.

Control Expectancies & Coping Styles - Control expectancies, cognitive appraisal and coping styles are important factors. These will be discussed in greater detail below in the context of training.

Critical Incident Exposure and Role Conflict - Although the severity and regularity of exposure to critical incidents cannot be controlled, role conflict is an area which can be addressed through practical interventions. Worker's can be assigned to units away from their home locality, realistic expectations of the success of the rescue should be ensured, clear communications from command centre and the officers in charge should be made and there should be clarity in the duties involved in each individual's role.

Peritraumatic Dissociation - Peritraumatic dissociation has been shown to be an important factor in the prediction of post traumatic stress reactions (Weiss et al 1995, Marmar et al 1996). The Marmar et al study identified certain factors that predicted likelihood of dissociation during the critical incident, these include appraisal of the

incident as threatening, external locus of control, avoidance styles of coping, and certain personality attributes. They are currently carrying out a prospective study of these factors and suggest that if individuals at high risk could be identified, then they could be selectively screened out or targeted for greater training and support.

Planning And Organisation

Green (1995) argues that planning and organisation of 'task and tools' strategies for response to critical incidents can be considered a form of primary prevention of stress reactions. Emergency service training is extensive in covering the practical theory and techniques of rescue work. This training provides the worker with the knowledge and expertise to respond to emergency situations. Effective training in the task and tools of emergency service work will increase performance effectiveness and decrease the likelihood that the situation can become chaotic. Therefore, post traumatic reactions can be minimised, since critical incidents are not perceived as threatening or uncontrollable. Rather, they are seen as an opportunity to fulfil the tasks which the fire fighter has been trained to carry out. This concept is reflected in the interview study results. Several of the interviewees noted that the job was most satisfying when they were fighting fires. In addition, Gibbs et al (1991) noted that in a study of emergency service worker's at the AVIANCA air crash worker's self rating of performance effectiveness was strongly and negatively correlated with the worker's symptoms.

Education

Green (1995) suggests that education can be a useful form of primary prevention. As discussed earlier increasing awareness of the positive and pathological psychological consequences of critical incident exposure helps to normalise them. Normalisation of reactivity to critical incidents may encourage timely disclosure and facilitate rapid recovery before difficulties become chronic in nature. Green suggests that communication, assertiveness and stress management training could all be useful additions to the emergency service workers training programmes enabling them to recognise and cope with difficulties quickly and effectively. Kagan et al (1995) has presented some research that shows that 'psychoeducational programs' given to 373 emergency medical service personnel significantly reduced depression, anxiety and

burnout which was maintained over a 9-16 month follow up period. Therefore there is some empirical evidence to suggest this is an area worthy of further development.

Training

Recently interest in training programmes which aim to prevent the negative psychological consequences of critical incident exposure has grown. Schema theory has been used as a way of conceptualising the impact of traumatic exposure on individuals (Horowitz 1979, Janoff-Bullman 1989, Peterson and Prout 1991). Recently Paton (1994, 1996, etc.) has suggested that the schema theory conceptualisation can provide a basis for constructing and evaluating training programs. Schemata serve as pre-existing theories which provide a basis for anticipating the future, they guide what individuals notice and remember, as well as how they interpret new information and new situations (Janoff-Bullman 1989, Fiske and Taylor 1984).

Paton argues that in an occupational context schemata will reflect the training and experience they have. Therefore, he maintains, "the personal impact of a traumatic event will be a function of the extent to which these schemata provide a viable framework within which a relief worker can make sense of the event and develop and implement appropriate and effective action plans." Training then, is designed to prepare individuals for the demands of their work and to provide them with the knowledge and skills to deal with them. Therefore, the effectiveness of training can be considered to be reflected in the degree to which the individuals schemata can accommodate or assimilate the demands of typical and atypical critical incidents. Paton argues that training developed within this theoretical context can therefore be an effective way of preventing or minimising stress reactions to traumatic events.

Although it is unlikely that psychological reactions to traumatic incidents can be completely eliminated, effective training can promote well being and minimise negative effects. In a study of specially trained volunteers (using the schema based training approach) and a group of fire fighters carrying out disaster relief work after the Armenian Earthquake in 1988, Paton (1994) found that the volunteers were less

likely to perceive the demands of the disaster as stressors and suffered fewer negative psychological effects following the work. Since schemata can be highly situation specific Paton argues that training must focus on general preparedness, on the common demands of disaster and emergency work, the context it takes place in (long hours, few breaks, etc.) as well as the demands of working within threatening and ambiguous situations in addition to the specific content and technical skills needed in emergency situations. He argues that increasing realistic expectations with respect to the likelihood of the effectiveness of the work and defining roles before arrival on site are also important components of training.

Conclusion

The members of critical occupations are unique with respect to the frequency that they encounter incidents which would be traumatic to most members of the general public. They are therefore, at a significantly higher risk of developing post traumatic stress symptomatology and post traumatic stress disorder. The prevention of such difficulties is an important issue for the emergency services. This document began by considering the diagnostic and theoretical perspectives within which PTSD can be understood. It then went on to consider the relevant empirical research which has identified certain risk factors in the aetiology of the disorder. This study aimed to explore whether traumatic stress reactivity was a significant problem in a group of fire fighters within normal operational duty. It also aimed to replicate previous empirical findings outside disaster situations, in order to explore whether these factors were applicable across occupations and situations. In addition, it considered factors such as positive outcomes of traumatic events, cognitive appraisal and on-scene and post event coping which have rarely been considered before. Evidence of post traumatic stress symptomatology was found in this population. The results showed that many of the factors which are considered to put emergency workers in disaster situations at risk are also relevant for routine operational fire fighters. The results were also consistent with the main theoretical accounts of post traumatic stress disorder and provide support for current attempts to devise preventative interventions.

Bibliography

- Aguilera, D.M. & Planchon, L.A. (1995) The American psychological Association-California Psychological Association Disaster response Project: Lessons from the past, guidelines for the future. *Professional Psychology: Research and practice*. Vol. 26, No. 6, Pp. 550-557.
- Aldwin, C.M. & Revenson, T.A., (1987) Does Coping Help?: A re-examination of the relation between coping and mental health. *Journal of Personality and Social Psychology*. Vol. 53, Pp. 337-438.
- Alexander, D.A., Innes, G., Irving, B.L., Sinclair, S.D. & Walker, L.D. (1991) Health, Stress and Policing: A study in Grampian Police.
- American Psychiatric Association (1980) *Diagnostic and Statistical Manual of mental Disorders.*, (3rd Edition) Washington, DC:APA.
- American Psychiatric Association (1987) *Diagnostic and Statistical Manual of mental Disorders.*, (3rd Edition Revised) Washington, DC:APA
- American Psychiatric Association (1994) *Diagnostic and Statistical Manual of mental Disorders.*, (4th Edition) Washington, DC:APA
- Andrews, G., Pollack, C. & Stewart, G. (1989) Determination Of Defense Style By Questionnaire. *Archives Of General Psychiatry*. Vol. 46; Pp. 455-460.
- Armfield, F. (1994) Preventing Post Traumatic Stress Disorder Resulting From Military Operations. *Military Medicine*. Vol. 159, No. 12, Pp. 739-746.
- Bartone, P., Ursano, R., Wright, K. & Ingraham, L. (1989) The Impact Of Military Air Disaster On The Health Of Assistance Workers. *Journal Of Nervous And Mental Disease*. Vol. 177, Pp. 317-328.
- Bernstein, E.M. & Putnam, F.W. (1986) Development, reliability, and validity of a dissociation scale. *Journal of Nervous and Mental Disease*. Vol. 174, Pp. 727 -735.
- Bisson, J.I., Jenkins, P.L., Alexander, J. & Bannister (1997) Randomised control trial of psychological debriefing for victims of acute burn trauma. *British Journal of Psychiatry*. Vol. 171, Pp 78-81.
- Blair, D.T. & Ramones. (1996) Understanding Vicarious Traumatization. *Journal of Psychosocial Nursing*. Vol. 34, No. 11, Pp 24-30.

- Blanchard, E.B., Hickling, E.J., Taylor, A.E., Loos, W.R., Forneris, C.A. & Jaccard, J. (1996) Who Develops PTSD From Motor Vehicle Accidents? Behaviour Research and Therapy. Vol. 34., No 1; Pp. 1-10.
- Bleich, A., Garb, R. & Kottler, M. (1986) Treatment of Prolonged Combat Reaction. *British Journal of Psychiatry*. Vol. 148 Pp. 493-496.
- Brandt, G.T., Fullerton, C.S., Saltzgaber, L., Ursano, R.J. & Holloway, H. (1995) Disasters: Psychologic responses in health care providers and rescue workers. *Nordic Journal Of Psychiatry*. Vol. 49, No. 2. Pp. 89-94.
- Brewin, C.R., Dalgliesh, T. & Joseph, S. (1996) A Dual Representation Theory of Post Traumatic Stress Disorder. *Psychological Review* Vol. 103, No. 4, Pp 670-686.
- Britton, N., Moran, C., & Correy, B. (1994) Stress Coping and Emergency Disaster Volunteers: A discussion of some of the relevant factors. In Dynes R & Tierney K (Eds.) *Disaster, Collective Behaviour And Social Organisation*, University Of Delaware Press, Newark, Delaware. Pp. 129-144.
- Buchner, A., Erdfelder, E., & Faul, F. (1997) How to use G*Power [WWW document] URL http://www.psychologie.uni-trier.de:8000/projects/gpower/how_to_use_gpower.html
- Carver, C.S., Scheier, M.F. & Weintraub, J.K. (1989) Assessing Coping Strategies: A theoretically based approach. *Journal of Personality and Social Psychology* . Vol. 56, No. 2; Pp 267-283.
- Clohesy, S. (1995) Post-Traumatic Stress Disorder Symptoms and Coping in the Ambulance Service. Unpublished manuscript submitted for Clinical psychology MSc. Warneford Hospital, Oxford Regional Training Course.
- Cohen, J. (1992) A Power Primer. *Psychological Bulletin*. Vol. 112, No. 1, pp 155-159.
- Cohen. S. & Wills, T.A. Stress. (1985) Social support and the buffering hypothesis. *Psychological Bulletin* Vol. 98 Pp. 310-57
- Compas, B.E., Worsham, N.L. and Ey, S. (1992) Conceptual and Developmental Issues in Children's Coping with Stress. In La Greca, A.M., Sigal, L.J., Wallander, J.L. & Walker, C.E. (Eds.) *Stress and Coping in Child Health*. Guildford Press, New York, London.
- Creamer, M., Burgess, P. & Pattison, P. (1992) Reaction to trauma: A cognitive processing model. *Journal of Abnormal Psychology*, Vol. 101, Pp. 452-459.

- Crowne, D.P., & Marlowe, R.R. (1960). A New Scale of Social Desirability independent of Psychopathology. *Journal of Consulting Psychology*. Vol. 24, Pp. 349-354.
- Daly, R.J. (1983) Samuel Pepys and post traumatic stress disorder. *British Journal of Psychiatry*, Vol. 143, Pp. 64-68.
- Davidson, J.R.T. & Foa, E.B. (Ed) (1993) Post Traumatic Stress disorder: DSM IV and beyond, 1st Edn. American Psychiatric Press, Washington.
- De Ridder, D. (1997) What is Wrong with Coping Assessment? A review of conceptual and methodological issues. *Psychology and Health* Vol.12, pp. 417-431.
- Deahl, M.P., Gillham, A.B., Thomas, J., Searle, M.M. & Srinivasan, M. (1994) Psychological sequelae following the gulf war: Factors associated with subsequent morbidity and the effectiveness of psychological debriefing *British Journal Of Psychiatry*. Vol. 165, Pp 60-65.
- Deiner, E., Emmons, R.A., Larson, R.J. & Griffin, S. (1985) The Satisfaction with Life Scale. *Journal of Personality Assessment*. Vol. 49, Pp 71-76.
- Derogatis, L.R (1982) Self Report Measures of Stress. In Golderberger L. & Breznitz, S. (Eds.) *Handbook Of Stress : Theoretical And Clinical Aspects*. The Free Press, New York. Pp. 271-294.
- Dunning, C.M. & Silva, M.N. (1980) Disaster-Induced Trauma In Rescue Workers. *Victimology*. Vol. 5, Parts 2-4; Pp. 287-297.
- Durham, R.C., Allan, T. & Hackett. C.A. (1997) On Predicting Improvement and relapse in Generalised Anxiety Disorder Following Psychotherapy. *British Journal of Clinical Psychology*. Vol. 36, Pp. 101-119.
- Dyregrov, A. (1989) Caring For Helpers in Disaster Situations: Psychological debriefing. *Disaster management*. Vol. 2., No.1. Pp 25-30.
- Dyregrov, A. & Mitchell, J.T. (1992) Work with traumatised children - Psychological effects and coping strategies. *Journal of traumatic Stress*, Vol. 5, Pp. 5-17.
- Emery, V.O., Emery, P.E., Shama, D.K., Quiana, N.A. & Jassani, A.K. (1991) Predisposing Variables in PTSD Patients. *Journal of Traumatic Stress*. Vol. 4, No. 3, Pp. 325-343.
- Epstein, S. (1990) Beliefs and symptoms in maladaptive resolutions of the traumatic neurosis. In D. Ozer, J.M. Healy & A.J. Stewart (Eds.) *Perspectives on Personality*, Vol. 3. London, Jessica Kingsley Publishers.

- Figley, C. (Ed) (1985) *Trauma And Its Wake* Vol. I. New York Brunner Mazel.
- Figley, C. (Ed) (1985) *Trauma And Its Wake* Vol. II. New York Brunner Mazel.
- Fiske, S.T. & Taylor, S.E. (1984) *Social Cognition*. Reading, MA: Addison-Wesley.
- Foa, E.B. & Kozak, M.J. (1986) Emotional Processing And Fear: Exposure to corrective information. *Psychological Bulletin*. Vol. 99; Pp. 20-35
- Foa, E.B., Steketee, G. & Rothbaum, B.O (1989) Behavioural/Cognitive Conceptualisations of Post Traumatic Stress Disorder. *Behaviour Therapy*. Vol. 20, Pp. 155-176.
- Foa, E.B., Riggs, D.S., Dancu, C.V. & Rothbaum, B.O. (1993) Reliability and Validity of Brief Instrument for Assessing Post-Traumatic Stress Disorder. *Journal of Traumatic Stress*, Vol. 6, No. 4, Pp. 459-473.
- Folkman, S, Lazarus, R.S., Dunkel-Schetter, C., De Longis, A & Gruen, R. (1986) The Dynamics Of A Stressful Encounter: Cognitive appraisal, coping and encounter outcomes. *Journal Of Personality And Social Psychology*. Vol. 50; Pp. 992-1003.
- Freedy, J.R., Shaw, D.I, Jarrell, M.P. & Masters, C.R. (1992) Towards an understanding of the psychological impact of natural disaster: an application of conservation resources model. *Journal Traumatic Stress*. Vol. 5, Pp. 441-454.
- Freedy, J.R. & Donkervoet, J.C. (1995) Traumatic Stress: An overview of the field. In Freedy, J.R. & Hobfoll, S.E. (Ed) *Traumatic Stress: From Theory to Practice*. Plenum Press, New York.
- Freedy, J.R. & Hobfoll, S.E. (Ed) (1995) *Traumatic Stress: From Theory to Practice*. Plenum Press, New York.
- Fullerton, C.S., McCarroll, J.E., Ursano R.J. & Wright, K.M. (1992) Psychological Responses Of Rescue Workers: Fire Fighters and Trauma. *American Journal Of Orthopsychiatry*. Vol. 62.; Pp. 371-378.
- Gibbs, M.S. (1989) Factors in the Victim that Mediate Between Disaster and Psychopathology: A review. *Journal Traumatic Stress*. Vol. 2, No. 4, Pp. 489 ~ 514.
- Gibbs, M.S., Drummond, J. & Lachenmeyer, J.R. (1993) Effects Of Disasters On Emergency Workers: A review, with implications for training and post disaster interventions. *Journal of Social Behaviour And Personality* Vol. 8, No. 5.; Pp. 189-212.

- Gillespie, D.F. & Streeter, C.L. (1994) Fitting Regression Models to Research Questions for Analysing Change in Non-experimental Research. *Journal of Social Work Research*. Vol. 18, No. 4, Pp. 239-244.
- Glesser, G.C, Green, B.L. And Winget, C. (1981) *Prolonged Psychological Effects Of Disaster: A Study of Buffalo Creek*. Academic press, New York.
- Goldeberg, D. (1978) *Manual of the General Health Questionnaire*. NFER-Nelson, Windsor.
- Gordon, R. (1998) Beyond Debriefing: Developing a supportive environment for high stress human services. In *Dealing With Stress And Trauma In Emergency Services: An International Conference* Pp. 26-28 Melbourne Social Biology Resources Centre.
- Graham, N.K. (1981) Done in, fed up, burned out: Too much attrition in EMS. *Journal of Emergency medical Services*, Jan, Pp. 24-29.
- Green, B.L. (1991) Evaluating The Effects Of Disasters. Psychological Assessment. *Journal Of Consulting And Clinical Psychology*. Vol. 3; Pp. 538-546.
- Green, B.L. (1995) Overview and Research Recommendations In National Institute of Mental Health, *Role Stressors and Supports for Emergency Workers*. Pp 1-22.
- Green, B.L., Wilson, J.P. & Lindy, J.D. (1985) Conceptualising Post Traumatic Stress Disorder: A psychosocial Framework. In C.R., Figley (Ed) *Trauma And Its Wake : The study and treatment of post traumatic stress disorder*. Vol. I. New York Brunner Mazel.
- Grevin, F. (1996) Post Traumatic Stress Disorder, Ego Defense Mechanisms And Empathy Among Urban Paramedics. *Psychological Reports*. Vol. 79, Pp 483-495.
- Haan, N. (1982) The Assessment of Coping, Defense and Stress. In Golderberger L. & Breznitz, S. (Eds.) *Handbook Of Stress : Theoretical And Clinical Aspects*. The Free Press, New York. Pp 255-268.
- Hamilton, V. & Warburton, D.M. (1979) *Human Stress and Cognition: An Information Processing Approach*. John Wiley and Sons.
- Hartsough, D.M. (1985) Emergency organisation role. In National Institute of Mental Health, *Role Stressors and Supports for Emergency Workers*. Pp. 48-58.
- Herman J.L. (1992) Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal Of Traumatic Stress*. Vol. 5, No. 3; Pp. 377 - 391.

- Hodgkinson, P.E. & Stewart. (1991) *Coping with Catastrophe: A Handbook of Disaster Management*. Routledge, London.
- Holaday, M., Warren-Miller, G., Smith, A. & Yost, T.E. (1995) A Comparison Of On-The-Scene Coping Mechanisms Used By Two Culturally Different Groups. *Counselling Psychology Quarterly*. Vol. 8 No. 1; Pp. 81-88.
- Holroyd, K.A. & Lazarus. R.S. (1982) Stress, Coping And Somatic Adaptation. In Golderberger L. & Breznitz, S. (Eds.) *Handbook Of Stress : Theoretical And Clinical Aspects*. The Free Press, New York. Pp 212-230.
- Holt, R.R. (1982) Occupational Stress. In Golderberger L. & Breznitz, S. (Eds.) *Handbook Of Stress : Theoretical And Clinical Aspects*. The Free Press, New York. Pp. 418 - 444.
- Horowitz, M.J. (1979) Psychological responses to Serious Life Events In Hamilton, V. & Warburton, D.M. (Eds.) *Human Stress and Cognition: An Information Processing Approach*. John Wiley and Sons.
- Horowitz, M.J., Wilner, N. & Alvarez, W. (1979) Impact Of Event Scale: A measure of subjective distress. *Psychosomatic Medicine*. Vol. 41., Pp. 1209 -1218.
- Horowitz, M.J. & Wilner, N. (1981) Life Events Stress And Coping. In Poon, L. (Ed.) *Ageing In The 80's*. American Psychological Association Washington Dc.
- Hytten, K. & Hasle, A. (1989) Fire Fighters: a study of stress and coping. *Acta Psychiatrica Scandinavica, 80: Supplement 355*.
- James, A. (1992) The Psychological Impact Of Disaster And The Nature Of Critical Incident Stress For Emergency Personnel. *Disaster Prevention and Management*. Vol. 1; Pp. 63-69.
- Janis, I.L. (1982) Decision making under Stress. In Golderberger L. & Breznitz, S. (Eds.) *Handbook Of Stress : Theoretical And Clinical Aspects*. The Free Press, New York. Pp. 68-87.
- Janoff-Bullman, R. (1985) The aftermath of victimisation: Rebuilding shattered assumptions. In C.R. Figley (Ed), *Trauma And Its Wake*. New York Brunner Mazel.
- Janoff-Bullman, R. (1989) Assumptive Worlds And The Stress Of Traumatic Events: Applications of the schema concept. *Social Cognition*. Vol. 7; Pp 113-136.
- Jenkins, S.R. (1997) Coping and Social Support among Emergency Dispatchers: Hurricane Andrew. *Journal of Social Behaviour and Personality*. Vol. 12, No. 1, Pp. 210-216.

- Kagan, N.I., Kagan, H. & Watson, M.G. (1995) Stress Reduction in the Workplace: The effectiveness of psychoeducational programs. *Journal of Counselling Psychology*. Vol. 42, No. 1, Pp. 71-78.
- Keane, T.M., Zimmering, R.T. & Caddel, R.T. (1985) A behavioural Formulation of PTSD in Vietnam Veterans. *Behaviour Therapist*. Vol. 8, Pp. 9-12.
- Kenardy, J. (1998) Psychological (Stress) Debriefing: Where are we now? *Australasian Journal of Disaster and trauma Studies*. Vol. 1998 - 1. [WWW Journal]
- Kilpatrick D.G., Saunders, B.E., Amick-McMullan, A., Best, C.L. Veronen, L.J. & Resnick, H.S. (1989) Victims and crime factors associated with the development of crime-related post-traumatic stress disorder. *Behaviour Therapy*. Vol. 20, Pp. 199-214.
- Kilpatrick D.G., Veronen, L.J. & Best, C.L. (1985) In Figley, C.R. (Ed.) *Trauma and its Wake*. Vol. 1. Brunner/Mazel. New York.
- Kuch, K., Travis, K. & Collins, P. (1995) Symptoms Of Post-Traumatic Stress Disorder In 11 Police Officers. *Canadian Journal Of Psychiatry*. Vol. 40 No. 2. Pp. 109
- Kulka, R.A., Schlenger, W.E., Fairbank, J.A., Hough, R.L., Jordan, K., Marmar, C.R. & Weiss, D.S. (1990) *Trauma and the Vietnam War Generation*. New York: Brunner / Mazel.
- Kushner, M.T., Riggs, D.S., Foa, E.B. & Miller, S.M. (1992) Perceived Controllability and the development of post traumatic Stress Disorder (PTSD) In Crime Victims. *Behaviour Research and Therapy*. Vol. 31, No 1, pp. 105-110.
- Laux, L. & Vossel, G. Paradigms in Stress Research, Laboratory versus Field and Traits versus Processes. In Golderberger L. & Breznitz, S. (Eds.) *Handbook Of Stress : Theoretical And Clinical Aspects*. The Free Press, New York. Pp. 203-211.
- Lazarus, R.S. & Folkman, S. (1984) *Stress Appraisal and Coping*. Springer Publishing Company, Inc.
- Linton, J.C. (1995) Acute Stress Management With Public Safety Personnel: Opportunities for clinical training and pro bono community service. *Professional-Psychology-Research-And-Practice*, Special Section: Trauma, Disaster Planning, And Psychological Services. Vol. 26. No. 6; Pp. 566-573.
- Livesay, J., (1989) Post Traumatic Stress Disorder In Fire-Fighters, Lancashire County Fire-Brigade Report.

- Marmar, C.R., Weiss, D.S., Schellinger, W.E., Fairbank, J.A., Jordon, B.K., Kulka, R.A. & Hough R.L. (1994) Peritraumatic dissociation and post traumatic stress in male Vietnam theatre veterans. *American Journal of Psychiatry*, Vol. 151, Pp. 902-907.
- Marmar, C.R., Weiss, D.S., & Metzler T.J., (1995) *The Peritraumatic Dissociative Experiences Questionnaire in Assessing Psychological Trauma and PTSD. : A Handbook for Practitioners*. Edited by Wilson J.P., Keane, T.M. New York , Guilford press.
- Marmar, C.R., Weiss, D.S., Metzler T.J. & Delucci, K.L. (1996) Characteristics Of Emergency Services Personal Related To Peritraumatic Dissociation During Critical Incident Exposure. *American Journal Of Psychiatry*. Vol. 153. No. 7 Festschrift Supplement Pp. 94-102.
- Maslach, C. & Jackson, S.E. (1981) The Measurement Of Experienced Burnout. *Journal Of Occupational Behaviour*. Vol. 2; Pp. 99-113.
- McCammon. S., Durham. T.W., Jackson Allison. E. & Williamson, J.E. (1988) Emergency Workers' Cognitive Appraisal And Coping With Traumatic Events. *Journal of Traumatic Stress*. Vol. 1. No. 3.; Pp. 353-372.
- McCammon. S. (1996) Emergency Medical Service Workers: Occupational Stress and Traumatic Stress In Paton, D. & Violanti, J. (Eds.) (1996) *Traumatic Stress In Critical Occupations: Recognition, Consequences And Treatment*. Springfield, Il Charles C. Thomas .
- McCann, L. & Pearlman, L.A. (1990) Vicarious Traumatization: A Framework for Understanding the Psychological Effects of Working with Victims. *Journal of Traumatic Stress*. Vol. 3, No. 1, Pp. 131-149.
- McFarlane, A.C., (1989) The Aetiology of Posttraumatic Morbidity: predisposing, precipitating and perpetuating factors. *British Journal of Psychiatry*. Vol. 154, Pp. 221-228.
- McFarlane, A.C., Atchison, M., Rafalowicz, E. & Papay, P. (1994) Physical Symptoms In Post-Traumatic Stress Disorder. *Journal Of Psychosomatic Research*. Vol. 38 No. 7; Pp. 715-726.
- McFarlane, A.C. (1998) The Longitudinal Course of posttraumatic morbidity. *Journal of Nervous and Mental Disease* Vol. 176, Pp 30-39.
- McGuire, B. (1990) Post Traumatic Stress Disorder: A review. *The Irish Journal of Psychology*. Vol. 11, No. 1, Pp. 1-23.

- McLeod, J. & Cooper, D. (1992) *A Study of Stress and Support in the Staffordshire Fire and Rescue Service*. Centre for Counselling Studies, Keele University.
- McMillen, J.C., Smith, E.M. & Fisher, R.H. (1997) Perceived Benefit and Mental Health After Three Types of Disaster. *Journal of Consulting and Clinical Psychology*. Vol. 65, No 5, Pp. 733-739.
- Mihaescu, G. & Baettig, D. (1996) An Integrated Model of Post Traumatic Stress Disorder. *European Journal of Psychiatry*. Vol. 10, No. 4, Pp. 233-242.
- Mitchell, J. (1988) The Impact Of Stress On Emergency Services Personnel: Policy issues in emergency response. In Comfort, L. (Ed) *Managing Disaster: Strategies And Policy Perspectives*, Duke University Press, London, Pp. 199-214.
- Moos, R.H. & Billings. A.G. (1982) Conceptualising And Measuring Coping Resources And Processes. In Golderberger L. & Breznitz, S. (Eds.) *Handbook Of Stress : Theoretical And Clinical Aspects*. The Free Press, New York. Pp. 212-230.
- Moos, R.H. (Ed.) (1987) *Coping with Life Crises: An Integrated Approach*. Plenum Press, New York.
- Moos, R.H. (1990) Coping Responses Inventory Manual. California: Centre for Healthcare Evolution, Stanford University Dept. Veterans' Administration Medical centres. Palo Alto, California 94305, USA.
- Moran, C. (1990) Does The Use Of Humour As A Coping Strategy Affect Stresses Associated With Emergency Work? *International Journal of Mass Emergency Disaster* .Vol. 8; Pp. 361-377.
- Moran, C. (1994) Psychological Benefits Of Disaster And Emergency Work. *Macedon Digest* . Vol. 9 No. 3 Pp. 4-6.
- Moran, C. & Britton, N.R. (1994) Emergency Work Experience And Reactions To Traumatic Incidents. *Journal Of Traumatic Stress*. Vol. 7. No. 4; Pp. 575-585.
- Moran, C. & Massam, M. (1997) An Evaluation of Humour in Emergency Work. *The Australasian Journal of Disaster and Trauma Studies*. Vol. 3 [WWW Journal]
- Moran, C. (1998) Individual Differences And Debriefing Effectiveness. *The Australasian Journal of Disaster and Trauma Studies*. Vol. 1998-1 [WWW Journal]
- Morgan, I.A., Matthews, G., & Winton, M. (1995) Coping And Personality As Predictors Of Traumatic Intrusion, Numbing Avoidance And General Distress: A Study Of Victims Of The Perth Flood.

- Mowrer, O.H. (1947) On the dual nature of learning - a reinterpretation of 'conditioning' and 'problem solving'. *Harvard Educational Review*. Vol.17, pp.102-148.
- Mowrer, O.H. (1960) *Learning Theory and Behaviour*. Wiley, New York.
- Myers, D.G. (1995) A Response to Role Simplification in Disaster, R. Dynes, E.Quarentelli. In National Institute of Mental Health, *Role Stressors and Supports for Emergency Workers*. Pp. 38-47.
- Norris, F.H. & Kaniasty, K. (1992) Reliability Of Delayed Self Reports In Disaster Research. *Journal Of Traumatic Stress*. Vol. 5; Pp. 575-588.
- Paton, D. (1992) Disaster Research: The Scottish Dimension *The Psychologist* 5: 535-538
- Paton, D.(1994) Disaster Relief Work: An Assessment Of Training Effectiveness. *Journal Of Traumatic Stress*. Vol. 7., No. 2; Pp. 275-288.
- Paton, D. & Smith, L.M. (1995) Work-related Psychological Trauma: A review of methodological and assessment Issues. *Australian Psychologist*. Vol. 30, No. 3, Pp. 200-209.
- Paton, D. & Smith, L.M. (1996) psychological trauma in critical Occupations. In D, Paton & J, Violanti (Eds.) *Traumatic Stress In Critical Occupations: Recognition, Consequences And Treatment*. Springfield , Il Charles C. Thomas.
- Paton, D and Stephens, C (1996) Training and Support for Emergency Responders. In D, Paton & J, Violanti (Eds.) *Traumatic Stress In Critical Occupations: Recognition, Consequences And Treatment*. Springfield , Il Charles C. Thomas .
- Paton, D. & Violanti, J. (Eds.) (1996) *Traumatic Stress In Critical Occupations: Recognition, Consequences And Treatment*. Springfield , Il Charles C. Thomas .
- Paton, D. (1996) Training Disaster Workers: promoting well-being and operational effectiveness. *Disaster prevention and Management*. Vol. 5, No. 5, Pp. 11-18.
- Paton, D. (1996) Traumatic Stress in Critical Occupations: Current Status and Future Directions. In D, Paton & J, Violanti (Eds.) *Traumatic Stress In Critical Occupations: Recognition, Consequences And Treatment*. Springfield , Il Charles C. Thomas .
- Paton, D.(1997) Managing Work-related psychological Trauma: An Organisational Psychology of Response and Recovery. *Australian Psychologist*. Vol. 32, No. 1, Pp. 46-55.

- Paton, D.(1997) Post-event Support for Disaster Workers: integrating recovery resources and the recovery environment. *Disaster prevention and Management*. Vol. 6, No. 1, Pp. 43-49.
- Paton, D.(1998) Work-related psychological trauma: A social Psychological and organistional approach to understanding response and recover. *The Australasian Journal of Disaster and Trauma Studies*. Vol. 1998-1 [WWW Journal]
- Paulhus, D.L. & Reid, D.B. (1991)Enhancement And Denial in Socially Desirable Responding. *Journal of Personality and Social Psychology*. Vol. 60, No. 2, Pp. 307-317.
- Paulhus, D.L. (1984) Two-Component Models of Socially Desirable Responding. *Journal of Personality and Social Psychology*. Vol. 46, No.3, Pp. 598-609.
- Peterson, K.C., Prout, M.F. & Schwartz, R.A. (1991) *Post Traumatic Stress Disorder: A clinicians guide*. Plenum Press, New York.
- Power, M.J., Dalgliesh, T., Claudio, V., Tata, P. & Kentish, J. (1998 In prep) The Directed Forgetting Task,: Application to emotionally valent material.
- Rachman, S. (1980) Emotional Processing. *Behaviour Research and Therapy*.Vol. 18; Pp. 51-60.
- Raphael, B., Meldrum, L. & O'Toole, B.I. (1991) Rescuer's Psychological Responses To Disasters. *British Medical Journal* Vol. 303, Pp. 1346-1347.
- Raphael, B., Singh, B., & Bradbury, L. (1986) Disaster: The Helper's Perspective. In Moos, R.H. *Coping With Life Crises*, Plenum, New York.
- Roth, S. & Cohen, L.J. (1986) Approach, Avoidance and Coping with Stress. *American Psychologist*. Vol. 41; Pp. 813-819.
- Ryff, C.D. (1989) Happiness Is Everything or Is It? Explorations on the Meaning of Psychological Well-Being. *Journal of Personality and Social Psychology*. Vol. 57, No. 6, Pp. 1069-1081.
- Schultz (1984)
- Scott, M.J. & Stradling, S.G. (1992) *Counselling for Post Traumatic Stress Disorder* Sage Publications, London.
- Scott, M.J. & Stradling, S.G. (1994) Post Traumatic Stress Disorder Without The Trauma. *British Journal Of Clinical Psychology*. Vol. 33 No. 1, Pp. 71-74.
- Shepherd, M., Hodgkinson, P.E. (1990) The Hidden Victims Of Disaster: Helper Stress. *Stress Medicine*. Vol. 6., No. 1.; Pp. 29-35.

- Smith, L.M. & Paton, D. (1997) A Structural Re-assessment of the Impact of Event Scale: The Influence of Occupational and Cultural Contexts. In G.M. Haberman (Ed.) *Proceedings of the 1997 Annual Conference of the New Zealand Psychological Society*. Pp. 240-251.
- Solomon, Z., Mikulincer, M., & Berbenishty, R. (1989) Locus of Control, and combat related post traumatic stress disorder: The intervening role of battle intensity, threat appraisal and coping. *British Journal of Psychology*. Vol. 28, Pp. 131-144.
- Solomon, Z., Mikulincer, M. & Avitzur, E. (1988) Coping, Locus of Control, social support and combat related post traumatic stress disorder: A prospective study. *Journal of Personality and Social Psychology*. Vol. 55, Pp. 279-285.
- Spitzer, W.J. & Neely, K. (1992) Critical Incident Stress: The role of Hospital based social work in developing state-wide intervention system for first responders delivering emergency services. *Social Work in Health Care*. Vol. 18, No. 1, 39-58.
- Spurrell, M.T. & McFarlane, A.C. (1993) Post-Traumatic Stress Disorder And Coping After A Natural Disaster. *Social Psychiatry And Psychiatric Epidemiology*. Vol. 28., No. 4.; Pp. 194-200.
- Stephens, C. (1997) Debriefing, Social Support and PTSD in the New Zealand Police: Testing a multidimensional model of organisational traumatic stress. *The Australasian Journal of Disaster and Trauma Studies*. Vol. 3 [WWW Journal]
- Taylor, S.E. & Frazer, , A.G. (1982) The stress of post-disaster body handling and victim identification work. *Journal of Human Stress* Pp. 4-12.
- Taylor, S.E. (1983) Adjustment To Threatening Events: A theory of cognitive adaptation. *American Psychologist*. Vol. 38, No. 11; Pp. 1161-1173.
- Tedeschi, R.G. & Calhoun, L.G. (1996) The Posttraumatic Growth Inventory: Measuring the Positive Legacy of Trauma. *Journal of Traumatic Stress*. Vol. 9, No. 3, Pp. 455-471.
- Tehrani, N. & Westlake, R. (1994) Debriefing Individuals Affected By Violence. *Counselling Psychology Quarterly*. Vol. 7., No. 3.; Pp. 251-259.
- Thompson, J.& Suzuki, I. (1991) Stress in Ambulance Workers. *Disaster Management*. Vol. 3, No. 4, Pp. 193-197.
- Thompson, J., Man Chueng Chung, & Rosser, R. (1994) The Marchioness Disaster: Preliminary report on psychological effects. *British Journal of Clinical Psychology*. Vol. 33, Pp. 75-77.

- Trimble, M.R. (1985) Post-traumatic Stress Disorder: History of a concept. In Figley, C. (Ed) *Trauma And Its Wake* Vol. I. New York Brunner Mazel.
- Van der Kolk, B.A. (1987) *Psychological Trauma*. American Psychiatric Press, Inc.
- Vanderlinden, J., Van Dyck, R., Vandereycken, W., Vertommen, H. & Verkes, R.J. (1993) The Dissociation Questionnaire (DIS-Q): Development and characteristics of a new self report questionnaire. *Clinical Psychology and Psychotherapy*. Vol. 1, No. 1, Pp. 21-27.
- Violanti, J.M. (1997) Residuals of Police Occupational Trauma. *The Australasian Journal of Disaster and Trauma Studies*. Vol. 3 Internet Journal.
- Weiss, D.S., Marmar, C.R., Metzler, T.J. & Ronfeldt, H.M. (1995) Predicting Symptomatic Distress In Emergency Services Personnel. *Journal Of Consulting And Clinical Psychology*. Vol. 63., No. 3; Pp. 361-368.
- Werner, H.R., Bates, G.W., Bell, R.C., Murdoch, P., & Robinson, R. (1992) Critical Incident Stress In Victoria State Emergency Service Volunteers: Characteristics of Critical Incidents, common stress responses and coping methods. *Australian-Psychologist*. Vol. 27., No. 3.; Pp. 159-165.
- Wilkinson, C.B. (1983) Symptomatic Aftermath Of A Disaster : Hyatt Regency Skywalk Collapse. *American Journal Psychiatry* . Vol. 140.; Pp. 1134-1139.
- Wilson, J.P (1994) The Historical Evolution of PTSD Diagnostic Criteria: From Freud to DSM-IV. *Journal of Traumatic Stress*. Vol. 7, No. 4, Pp. 680-698.
- Wilson, J.P (1985) A comparative Analysis of PTSD Among Various Survivor Groups In Figley, C. (Ed) *Trauma And Its Wake* Vol. I. New York Brunner Mazel.
- Wilson, J.P. & Krauss, G.E. (1985) Predicting Post traumatic Stress disorders among Vietnam veterans. In W. Kelly (Ed.) *Post-Traumatic Stress Disorder and the War veteran patient*. New York Brunner/ Mazel.
- World Health Organisation (1992) *Psychosocial Consequences of Disasters: Prevention and Management*. WHO Division Of Mental Health Geneva.

Appendix 1

DIAGNOSTIC CRITERIA FOR PTSD: DSM-IV

- I. The person has been exposed to a traumatic event in which both of the following are present:
 - 1. The person has experienced, witnessed or been confronted with an event or events that involve actual or threatened death or serious injury, or threat to the physical integrity of oneself or others.
 - 2. The person's response involved intense fear, helplessness or horror. Note: in children it may be expressed instead by disorganised or agitated behaviour.
- II. The traumatic event is persistently re-experienced in at least one of the following ways:
 - 1. Recurrent and intrusive recollections of the event, including images, thoughts or perceptions. Note: in young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
 - 2. recurrent distressing dreams of the event. Note in young children, there may be frightening dreams without recognisable content.
 - 3. acting and feeling as if the traumatic event were recurring (including a sense of reliving the experience, illusions, hallucinations and dissociative flashback episodes, including those that can occur upon waking or when intoxicated.) Note: in young children, trauma specific re-enactment may occur.
 - 4. intense psychological distress at exposure to internal or external cues that symbolise or resemble an aspect of trauma.
 - 5. physiologic reactivity upon exposure to internal or external cues that symbolise or resemble an aspect of the trauma.
- III. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by at least three of the following:
 - 1. efforts to avoid thoughts, feelings or conversations associated with the trauma.
 - 2. efforts to avoid activities, places or people that arouse recollections of the trauma.
 - 3. inability to recall an important aspect of the trauma.
 - 4. markedly diminished interest or participation in significant activities.
 - 5. feeling of detachment or estrangement from others.

6. restricted range of affect (e.g., unable to have loving feelings).
 7. sense of foreshortened future (e.g., does not expect to have a career, marriage, children or a normal life span).
- IV. Persistent symptoms of increased arousal (not present before the traumas indicated by at least two of the following:
1. difficulty falling or staying asleep
 2. irritability or outbursts of anger
 3. difficulty concentration
 4. hypervigilance
 5. exaggerated startle response.
- V. Duration of the disturbance (symptoms B,C and D) is more than one month.
- VI. The disturbance causes clinically significant distress or impairment in social, occupational or other important areas of functioning.

Specify if:

- | | |
|----------------|---|
| ACUTE: | if duration is less than three months. |
| CHRONIC: | if duration of symptoms is three months or more |
| DELAYED ONSET: | onset of symptoms is at least six months after exposure to the stressor |

Appendix 2 -

ETHICS COMMITTEE CORRESPONDENCE

Your Ref: 98/002
Our Ref: JEW/AMH
Enquiries to: Jackie Warburton
Ext. No: 0131 537 9522
Date: 23rd December 1997



Ms Pennie Blackburn
Department of Clinical Psychology
Stratheden Hospital
CUPAR KY15 5RR

Headquarters
St Roque, Astley Ainslie Hospital
133 Grange Loan, Edinburgh, EH9 2HL
Tel: 0131 537 9000 Fax: 0131 537 9500
Reception: 0131 537 9525
Direct Dial:

Dear Ms Blackburn

Research Proposal: Well-being and Stress within the Fire Service.

A copy of the above research proposal has recently been submitted to me for management approval. I would like to confirm that the Edinburgh Healthcare NHS Trust approves your proposal subject to the written approval of the Research Ethics Sub-Committee.

A condition of this approval is that you advise me, in advance, of any significant proposed deviation from the original protocol.

Finally, if for any reason this research does not go ahead I would be grateful if you could advise me.

With best wishes.

Yours sincerely

D J FROTH
CHIEF EXECUTIVE

cc Val Stewart

Department of Clinical Psychology,
Stratheden Hospital,
Cupar, Fife.
KY15 5RR.

G Masterton,
Chairman Research Ethics Subcommittee
(Psychiatry And Clinical Psychology)
Department of Psychological Medicine,
The Royal Infirmary Of Edinburgh
Lauriston Place,
Edinburgh, EH3 9YW.

30th January 1998.

Dear Mr Masterton,

52/97 Well-being and Stress within the Fire Service.

Thank you for your letter of 15th January 1998 advising me that the Ethics Committee is willing to approve the above study subject to the qualification that a circular should be sent round the Fife GPs informing them that the above study is taking place. I am writing to confirm that I am willing to accept the qualification.

Yours sincerely,

Pennie Blackburn.
Trainee Clinical psychologist



THE ROYAL INFIRMARY OF EDINBURGH

Lauriston Place
Edinburgh EH3 9YW
Telephone 0131 536 1000
Fax 0131 536 1001

THE
ROYAL
INFIRMARY
OF EDINBURGH
NHS TRUST

CHIEF EXECUTIVE

John J Owens BSc, DMS, MBA

Ms Pennie Blackburn
Trainee Clinical Psychologist
Department of Clinical Psychology
Stratheden Hospital
CUPAR
Fife KY15 5RR

GM/ASM
5th February 1998
Psychological Medicine
Tel: 536 2875
Fax: 536 3408

Dear Ms Blackburn

52/97
Well-being and stress within the Fire Service

Thanks for your letter of 30th January intimating acceptance of the qualifications made by our ethics committee. I am pleased to confirm approval for your study.

Yours sincerely

G MASTERTON
CHAIRMAN
RESEARCH ETHICS SUBCOMMITTEE
PSYCHIATRY & CLINICAL PSYCHOLOGY

Dept. of Clinical psychology,
Stratheden Hospital,
Cupar Fife,
KY15 5RR.

Dear GP,

I am writing to inform you that I am carrying out a research project entitled Stress And Well-Being Within Fife Fire Service. The study is in two parts. A questionnaire pack has been distributed amongst all Fire fighters within Fife Fire Service. The questionnaires include demographic information, information relating to stress and well-being and details of a critical incident attended within the last two years, specified by the participant. This questionnaire survey is an anonymous study. The second part of the study is an interview based study collecting more qualitative data from approximately 10 participants.

The study is being carried out as part of my doctoral requirements in Clinical Psychology, at the University / East of Scotland Training course in Clinical Psychology. As such Ethics approval was sought from Lothian Healthcare NHS Trust. At their request I am obliged to inform all GPs in Fife that the study is being carried out.

I do not anticipate any healthcare implications of the study. However should any fire-fighter require psychological intervention as a result of the study I shall of course inform their GP.

Should you require any further information about the study please do not hesitate to contact me.

your faithfully,

Pennie Blackburn
Trainee Clinical Psychologist.

Appendix 3

Questionnaire Pack

Thank you for agreeing to take part in this study.

The Aims of The Study

There are several different ways of coping with stressful events. Certain ways of coping may help people to have a greater sense of well-being following stressful incidents than others. This study aims to look at the different ways of coping with the stressful aspects of your job and to compare these with the level of stress and well-being you experience.

Understanding more about how coping styles relate to stress and well-being may help in developing training and support systems within the Fire service.

The study falls into two parts. A questionnaire study and an interview study. The questionnaire study looks at stress and well-being in relation to one traumatic incident that you will be asked to identify. This part of the study aims to look at the ways of coping which are most effective in response to a traumatic incident. This questionnaire pack is being distributed among all the full-time fire fighters in the Fife Fire and Rescue Service. I have described it more below. Once the questionnaire study is complete I will be asking for approximately 20 people who would like to volunteer to take part in the interview study. The interview study aims to look more closely at the day to day work of the Brigade. More information about the interview part of the study will be available at a later date.

The Questionnaire Pack

This questionnaire pack contains some general questions about you (such as your age and how long you have worked in the Fire service), your job and your sense of well-being. It also contains some questions about a major incident that you have worked at, the way you coped with it at the time and afterwards and the effects you experienced as a result.

Please answer all the questions. Try not to spend too long thinking about the answers that you give. There are no right or wrong answers, so choose the most accurate answer for you and not what you think most people should or would say and do. Completing the questionnaire should take about 30-40 minutes.

Confidentiality

Participation in this study is voluntary. You will be able to fill in the questionnaire without giving your name and no-one will be told whether or not you participated in the study. Both the questionnaires and any information you give to me will be treated as strictly confidential and kept anonymous. The information gathered from all the participants will be used to prepare a report and will be fed back to the Fire Service. However, no information included in the report will identify any single individual. The questionnaire asks you for your job title, however this will only be used for statistical purposes and no attempt will be made to identify any individual from any of the information gathered. When you have completed the questionnaire pack please place it within the envelope and seal it. All the sealed envelopes will then be passed back to me for statistical analysis. All the questionnaires will be destroyed once I have completed the study.

Further Questions

If you have any further questions about the study you can contact me at:-

Dept. Clinical Psychology,
Stratheden Hospital,
Cupar, Fife, KY15 5RR.
Tel: (01334) 652 611 ext. 336

If you would like to ask any questions of someone who is not involved in the research please contact Miss Kate Thompson, who has agreed to give impartial help and advice about the study. She can also be reached at the above address.

If you would like the opportunity to see a psychologist for help with any difficulties that this study may highlight, please do not hesitate to contact me.

Thank you very much for your help and co-operation,

Janie Blackburn.

Information About You

Age

Sex

Marital Status

Number of Children

Job Title

Number of Years in the Fire Service

What was your occupation before you joined the Fire Service?

What interests do you have, outside the Brigade?
(e.g. playing football, etc.)

Approximately how many days off sick did you have last year?

Approximately how many cigarettes do you smoke a day?

Approximately how much alcohol do you drink a week?
1 unit = 1/2 pint or 1 single

Have you ever been personally involved in a traumatic incident? (i.e. not in your work capacity)

Yes: What was this incident (e.g. RTA, Personal Assault etc.)

When was it?

Have you ever attended a traumatic incident for which Critical Incident Debriefing was provided (or one that would fulfil the criteria for Critical incident debriefing if it was not available).

Yes: How many such incidents have you attended?

When was it / were they?

Approximately how many traumatic or personally disturbing incidents have you worked at over the last 6 months?

What kind of incidents were these?

For the people listed below, Please circle a number from 1 to 5 to show how well you feel they react to your needs.

	Very Unsupportive				Very Supportive
Spouse / Wife or Partner	1	2	3	4	5
Family	1	2	3	4	5
Friends	1	2	3	4	5
Colleagues	1	2	3	4	5
Other staff	1	2	3	4	5

CRITICAL INCIDENT EXPOSURE SCALE

The Incident

Please identify one single incident that you have attended as part of your work in the last 2 years, which stands out as one that would usually be very distressing to a member of the general public.

Please give a brief description of the incident below:

Please complete the items below by circling the choice that best describes experiences you had in the traumatic incident you have selected.

	1 Not at all true	2 Slightly true	3 somewhat true	4 very true	5 extremely true
worked long, tiring shifts with few breaks	1	2	3	4	5
received unclear or contradictory communications from command centre	1	2	3	4	5
was unable to use certain equipment when I thought it was important to do so	1	2	3	4	5
believed my life was in danger	1	2	3	4	5
participated in retrieving trapped bodies	1	2	3	4	5
was not able to fully use my expertise in a timely manner because of factors beyond my control	1	2	3	4	5
was exposed to the harshness of the weather conditions (wind, rain, cold)	1	2	3	4	5
saw dismembered bodies or isolated body parts	1	2	3	4	5
worried about the safety of my own family	1	2	3	4	5
saw dead people who were not treated with respect	1	2	3	4	5
was able to get plenty of sleep on the night/s of the traumatic incident	1	2	3	4	5
the media interfered with the traumatic incident	1	2	3	4	5
was concerned about the emotional reactions of the people I worked closely with during the traumatic incident	1	2	3	4	5
had access to adequate restroom and washing facilities	1	2	3	4	5
was able to get plenty of food during the traumatic incident	1	2	3	4	5
removed badly injured victims	1	2	3	4	5
the media was responsible and helpful in reporting the events of the traumatic incident	1	2	3	4	5
worked in filthy conditions during the traumatic incident	1	2	3	4	5
crowded into tight spaces during the traumatic incident	1	2	3	4	5
was exposed to the smell of rotting or burned bodies	1	2	3	4	5
was exposed to repeated, loud noises during the traumatic incident	1	2	3	4	5
had to carry out dangerous procedures on my own, without support from my unit	1	2	3	4	5

1 Not at all true	2 Slightly true	3 somewhat true	4 very true	5 extremely true
-------------------------	-----------------------	-----------------------	-------------------	------------------------

I felt efforts of other emergency services personnel placed me in danger	1	2	3	4	5
I worried that my family could not cope with their problems when I was separate from them	1	2	3	4	5
I saw multiple bodies at the same time	1	2	3	4	5
I was required to dismember bodies to help remove them during the traumatic incident	1	2	3	4	5
There were children or young people involved in the incident	1	2	3	4	5
I identified with or felt an association with the victim/s of the traumatic incident or their family	1	2	3	4	5
During the traumatic incident there were people watching what was going on	1	2	3	4	5
I experienced a dead body for the first time during the incident	1	2	3	4	5
The incident was one of the largest I have ever attended	1	2	3	4	5
I knew one or more of the victims of the traumatic incident	1	2	3	4	5
I was overwhelmed by the enormity of incident	1	2	3	4	5
I felt unprepared for the incident	1	2	3	4	5
I felt my own safety was at risk during the traumatic incident	1	2	3	4	5
I did not know what to expect when I arrived at the incident	1	2	3	4	5
Members of the public interfered with the traumatic incident	1	2	3	4	5
The incident was something that I had never dealt with before	1	2	3	4	5

COGNITIVE APPRAISAL SCALES

How you saw the Incident

Thinking about the traumatic incident as before please describe how you thought about it, as it affected you personally. On the six point scale provided (where 0= not at all to 5 = very much so), show how each one of the following adjectives describes your opinions and perceptions of the incident. Do this by circling the appropriate number on each scale.

Threatening	0	1	2	3	4	5	Pitiful	0	1	2	3	4	5
Challenging	0	1	2	3	4	5	Invigorating	0	1	2	3	4	5
Fearful	0	1	2	3	4	5	Frightening	0	1	2	3	4	5
Enjoyable	0	1	2	3	4	5	Thrilling	0	1	2	3	4	5
Worrying	0	1	2	3	4	5	Terrifying	0	1	2	3	4	5
Stimulating	0	1	2	3	4	5	Enlivening	0	1	2	3	4	5
Dangerous	0	1	2	3	4	5	Disgusting	0	1	2	3	4	5
Exhilarating	0	1	2	3	4	5	Stimulating	0	1	2	3	4	5
Painful	0	1	2	3	4	5	Disturbing	0	1	2	3	4	5
Exciting	0	1	2	3	4	5	Instructive	0	1	2	3	4	5
Depressing	0	1	2	3	4	5	Intolerable	0	1	2	3	4	5
Informative	0	1	2	3	4	5	Interesting	0	1	2	3	4	5

Now please answer the following questions about the incident. Use the six point scales as before to indicate how much you agree with the following statements WHEN YOU ARRIVED AT THE INCIDENT. [0= not at all to 5 = very much so]

	not at all	0	1	2	3	4	very much so	5
When you arrived at the incident it was something you just had to accept	0	1	2	3	4	5		
When you arrived at the incident it was something you could change or do something about by your actions.	0	1	2	3	4	5		
When you arrived at the incident it was a situation in which you needed more information before you could act	0	1	2	3	4	5		
When you arrived at the incident it was a situation which was likely to get out of control	0	1	2	3	4	5		
When you arrived at the incident it was a situation where you were unsure of how much influence you could have	0	1	2	3	4	5		
When you arrived at the incident it was a situation which you felt you had to hold back from doing what you wanted to do	0	1	2	3	4	5		
When you arrived at the incident it was a situation which you could deal with effectively	0	1	2	3	4	5		
When you arrived at the incident it was a situation which was going to be just too much for you to cope with personally	0	1	2	3	4	5		

On-Scene Coping

The next section asks about how you coped with the incident you described above at the time. Circle a number to indicate which of the following you did DURING YOUR WORK AT THE INCIDENT SITE, using the scale below.

0 No	1 A Little Bit Once Or Twice	2 Somewhat Or Sometimes	3 A Lot / Very Much So Fairly Often
---------	------------------------------------	-------------------------------	---

During the Incident Did You:

Think of different ways to deal with the incident	0	1	2	3
Tell yourself things to make yourself feel better	0	1	2	3
Talk with other fire fighters about the incident	0	1	2	3
Make a plan of action and follow it	0	1	2	3
Try not to feel part of the incident	0	1	2	3
Try to resign yourself to what was happening and get on with the job	0	1	2	3
Try to help others deal with the incident	0	1	2	3
Take it out on other people when you felt angry or depressed	0	1	2	3
Try to step back from the situation and be more objective	0	1	2	3
Remind yourself of how much worse things could be	0	1	2	3
Try to work together with other people	0	1	2	3
Know what had to be done and try hard to make things work	0	1	2	3
Try to suppress your emotions	0	1	2	3
Realise you had no control over the incident	0	1	2	3
Think about doing the job as well as possible	0	1	2	3
Take a chance and do something risky	0	1	2	3
Go over in your mind what you would do	0	1	2	3
Try to see the good side of the situation	0	1	2	3
Talk with the person in charge of the job	0	1	2	3
Decide what to do and try hard to do it	0	1	2	3
Try not to think about the casualties as people	0	1	2	3
Think that the outcome would be decided by fate	0	1	2	3
Find something to get away from what was happening	0	1	2	3

0 No	1 A Little Bit Once Or Twice	2 Somewhat Or Sometimes	3 A Lot / Very Much So Fairly Often
---------	------------------------------------	-------------------------------	---

During the Incident Did You:

Let your feelings out	0	1	2	3
Try to anticipate how things would turn out	0	1	2	3
Think about how you were much better off than other people doing similar work	0	1	2	3
Seek help from people or groups who have worked at similar incidents	0	1	2	3
Try at least two different ways to carry out the job	0	1	2	3
Try not to think about the meaning of what you were doing	0	1	2	3
Accept it, and get on with the job	0	1	2	3
Try to keep busy at the incident	0	1	2	3
Tell or shout to let off steam	0	1	2	3
Try to find some personal meaning in the situation	0	1	2	3
Tell yourself that things would get better	0	1	2	3
Try to find out more about the situation	0	1	2	3
Try to work out the best way to tackle the incident	0	1	2	3
Wish the incident would somehow go away or be over with	0	1	2	3
Expect the worst possible outcome	0	1	2	3
Exchange jokes about the incident	0	1	2	3
Try to let your feelings out	0	1	2	3
Try to anticipate the new demands that would be placed on you	0	1	2	3
Think about how this incident could change your life in a positive way	0	1	2	3
Ask for guidance and/or strength	0	1	2	3
Make things one step at a time	0	1	2	3
Try to deny how serious the incident actually was	0	1	2	3
Think about going off duty	0	1	2	3
Use hope that things would ever be the same	0	1	2	3
Throw yourself into the work and be guided by the rules	0	1	2	3
Do something that you didn't think could work, but at least you were doing something	0	1	2	3

PERITRAUMATIC DISSOCIATION QUESTIONNAIRE ~SELF REPORT

PDEQ - SR

Please complete the items below by circling the choice that best describes your experiences and reactions DURING THE INCIDENT AND IMMEDIATELY AFTERWARDS.

0 does not apply	1 Not at all true	2 Slightly true	3 somewhat true	4 very true	5 extremely true
------------------------	-------------------------	-----------------------	-----------------------	-------------------	------------------------

- had moments of losing track of what was going on - I
'blanked out" or "spaced out" or I some way felt that I was
not part of what was going on.

012345
- found that I was on automatic pilot - I ended up doing
things that I later realised that I hadn't actively decided to do.

012345
- My sense of time changed things seemed to be happening in
slow motion.

012345
- What was happening seemed unreal to me, like I was in a
dream or watching a movie or a play.

012345
- felt as though I were a spectator watching what was
appening to me, as if I were floating above the scene or
observing it as an outsider.

012345
- There were moments when my sense of my own body seemed
distorted or changed. I felt disconnected from my own body,
or that it was unusually large or small.

012345
- felt as though things that were actually happening to others
were happening to me - like I was being trapped when I
really wasn't.

012345
- was surprised to find out afterwards that a lot of things had
happened at the time that I was not aware of, especially
things I ordinarily would have noticed.

012345
- felt confused, that is, there were moments when I had
difficulty making sense of what was happening.

012345
- felt disoriented, that is, there were moments when I felt
uncertain about where I was or what time it was.

012345

POST TRAUMATIC STRESS DIAGNOSTIC SCALE ~TIME 1

Your Experiences After the Incident

Please answer the following questions (using the scale 0-3 below) according to what happened during the hours, days and weeks after the incident that you selected above.

0 Not at all	1 Once a week or less A little bit Once in a while	2 2-4 times a week Somewhat Half the time	3 5 + times a week Very Almost always
-----------------	---	--	--

Did you have upsetting thoughts or images about the incident, that came into your mind when you didn't want them to? 0 1 2 3
 If yes, approximately how long did these go on for ?
 (for example one day, a few days, a few weeks, six months etc.)

Did you have had dreams or nightmares about the incident you were involved in? 0 1 2 3
 If yes, approximately how long did these go on for ?

Did you have the experience of reliving the incident/ job, acting or feeling as if it were happening again? 0 1 2 3
 If yes, approximately how long did this go on for ?

Did you find you became emotionally upset when reminded of the incident (includes becoming very angry scared, sad, etc.) 0 1 2 3
 If yes, approximately how long did this go on for ?

Did you have any physical reactions (for example breaking out in a sweat, heart beating faster, hands shaking,)when reminded of the incident? 0 1 2 3
 If yes, approximately how long did these go on for ?

Did you try not to think about or have feelings associated with the incident or job? 0 1 2 3
 If yes, approximately how long did this go on for ?

Did you make efforts to avoid activities, situations or places that reminded you of the incident or job? 0 1 2 3
 If yes, approximately how long did this go on for ?

Were there any important parts about the incident / job that you still can't remember? 0 1 2 3
 If yes, approximately how long did this last ?

Did you find that you were not interested in things you used to enjoy doing? 0 1 2 3
 If yes, approximately how long did this go on for ?

Did you feel distant or cut off from others around you? 0 1 2 3
 If yes, approximately how long did this go on for ?

Did you feel emotionally numb (for example felt sad but unable to cry, unable to have loving feelings)? 0 1 2 3
 If yes, approximately how long did this go on for ?

Did you feel like any future plans or hopes had changed, because of the incident or (for example, will have no career, marriage, children or long life) ? 0 1 2 3
 If yes, approximately how long did this go on for ?

Did you have having problems falling or staying asleep? 0 1 2 3
 If yes, approximately how long did this go on for ?

0 Not at all	1 Once a week or less A little bit Once in a while	2 2-4 times a week Somewhat Half the time	3 5 + times a week Very Almost always
-----------------	---	--	--

Were you irritable or did you have outbursts of anger? 0 1 2 3
 If yes, approximately how long did this go on for ? _____

Did you have having difficulty concentrating (for example drifting in and out of
 conversations, losing track of a story on TV, having difficulty remembering what
 you've read)? 0 1 2 3
 If yes, approximately how long did this go on for ? _____

Did you find that you were overly alert (for example, checking to see ho is around
 you, uncomfortable with your back to the door, etc.)? 0 1 2 3
 If yes, approximately how long did this go on for ? _____

Did you find that you were jumpier or more easily startled (for example when
 someone walks up behind you)? 0 1 2 3
 If yes, approximately how long did this go on for ? _____

COPING RESOURCES INVENTORY ~ POST EVENT

Coping

The next section asks about how you coped with the incident AFTER YOU FINISHED WORKING AT THE SITE. The questionnaire is similar to the on-scene coping questionnaire you answered before, but this time please answer the questions thinking about the time following the incident.

0 No	1 Yes, Once or twice	2 Yes, Sometimes	3 Yes, Fairly Often
---------	----------------------------	------------------------	---------------------------

After the Incident Did you:

Think of different ways to deal with the situation	0	1	2	3
Tell yourself things to make yourself feel better	0	1	2	3
Talk with your partner or other relative about the incident	0	1	2	3
Make a plan of action and follow it	0	1	2	3
Try to forget the whole thing	0	1	2	3
Feel that time would make a difference - the only thing to do was wait	0	1	2	3
Try to help others deal with the incident	0	1	2	3
Take it out on other people when you felt angry or depressed	0	1	2	3
Try to step back from the situation and be more objective	0	1	2	3
Remind yourself of how much worse things could be	0	1	2	3
Talk with a friend about the incident	0	1	2	3
Know what had to be done and try hard to make things work	0	1	2	3
Try not to think about the incident	0	1	2	3
Realise you had no control over the incident	0	1	2	3
Get involved in new activities	0	1	2	3
Take a chance and do something risky	0	1	2	3
Go over in you mind what you would say or do	0	1	2	3
Try to see the good side of the situation	0	1	2	3
Talk with a professional person (e.g. doctor lawyer, clergy)	0	1	2	3
Decide what you wanted and try hard to get it	0	1	2	3
Daydream or imagine a better time or place than the one you were in	0	1	2	3
Think that the outcome would be decided by fate	0	1	2	3
Try to make new friends	0	1	2	3

0 No	1 Yes, Once or twice	2 Yes, Sometimes	3 Yes, Fairly Often
---------	----------------------------	------------------------	---------------------------

After the Incident Did you:

Keep away from people in general	0	1	2	3
Try to anticipate how things would turn out	0	1	2	3
Think about how you were much better off than other people doing similar work	0	1	2	3
Seek help from people or groups who have worked at similar incidents	0	1	2	3
Try at least two different ways to tackle the incident	0	1	2	3
Try to put off thinking about the incident although you knew you would have to at some point	0	1	2	3
Accept it; nothing could be done	0	1	2	3
Lead more often as a source of enjoyment	0	1	2	3
Tell or shout to let off steam	0	1	2	3
Try to find some personal meaning in the situation	0	1	2	3
Tell yourself things would get better	0	1	2	3
Try to find out more about the situation	0	1	2	3
Try to learn to do more things on your own	0	1	2	3
Wish the incident would somehow go away or be over with	0	1	2	3
Expect the worst possible outcome	0	1	2	3
Spend more time in recreational activities	0	1	2	3
Try to let your feelings out	0	1	2	3
Try to anticipate the new demands that would be placed on you	0	1	2	3
Think about how this incident could change your life in a positive way	0	1	2	3
Ask for guidance and/or strength	0	1	2	3
Take things a day at a time / one step at a time	0	1	2	3
Try to deny how serious the incident actually was	0	1	2	3
Wish you hope that things would ever be the same	0	1	2	3
Return to work or other activities to help you manage things	0	1	2	3
Do something that you didn't think could work, but at least you were trying something	0	1	2	3
Think through the incident on my own in an objective way	0	1	2	3

0 No	1 Yes, Once or twice	2 Yes, Sometimes	3 Yes, Fairly Often
---------	----------------------------	------------------------	---------------------------

After the Incident Did you:

Pick out the good points or aspects of the job	0	1	2	3
Talk to close colleagues about the incident and my feelings	0	1	2	3
Think about the best way to deal with the my feelings	0	1	2	3
Suppress my emotions	0	1	2	3
Try to accept what has happened	0	1	2	3
Enjoy playing sports or engaging in other pastimes	0	1	2	3
Release nervous energy through sports or other pastimes	0	1	2	3
Use critical incident debriefing to analyse the incident	0	1	2	3
Go out with the watch	0	1	2	3
Use Humour	0	1	2	3
Try to separate home from work, use home as a refuge	0	1	2	3
Seek support from superiors	0	1	2	3
Drink alcohol	0	1	2	3
Talk about my feelings in Critical Incident debriefing	0	1	2	3
Try to distract myself and think about something else	0	1	2	3

PTGI

Indicate for each of the statements below the degree to which this change occurred in your life as a result of the incident you have described above.

0 I did not experience this change as a result of the incident	1 I experienced this change to a very small degree as a result of this incident	2 I experienced this change to a small degree as a result of this incident	3 I experienced this change to a moderate degree as a result of this incident	4 I experienced this change to a great degree as a result of this incident	5 I experienced this change to a very great degree as a result of this incident	
My priorities about what is important in life changed.	0	1	2	3	4	5
developed a better appreciation for the value of my own life.	0	1	2	3	4	5
developed new interests.	0	1	2	3	4	5
developed a feeling of self reliance.	0	1	2	3	4	5
developed a better understanding of spiritual matters.	0	1	2	3	4	5
realised that I that I can count on people in times of trouble.	0	1	2	3	4	5
established a new path for my life.	0	1	2	3	4	5
developed a sense of closeness with others.	0	1	2	3	4	5
developed a greater willingness to express my emotions.	0	1	2	3	4	5
My knowledge that I can handle difficulties was strengthened.	0	1	2	3	4	5
discovered that I'm able to do better things with my life.	0	1	2	3	4	5
learned how to be able to accept the way things work out.	0	1	2	3	4	5
developed a greater appreciation for each day.	0	1	2	3	4	5
discovered new opportunities that are available that I couldn't have been otherwise.	0	1	2	3	4	5
started having more compassion for others.	0	1	2	3	4	5
started putting effort into my relationships.	0	1	2	3	4	5
am more likely to try to change things which need changing.	0	1	2	3	4	5
have a stronger religious faith.	0	1	2	3	4	5
discovered that I'm stronger than I thought I was.	0	1	2	3	4	5
learned a great deal about how wonderful people are.	0	1	2	3	4	5
accept needing others more.	0	1	2	3	4	5

General Health Questionnaire - 12

This section asks you if you have had any medical complaints and how your health has been in general, over the last few weeks. Please answer all the questions simply by underlining the answer which you think most nearly applies to you. Remember the questions relate to present and recent complaints, not those that you had in the past.

Have you recently:

been able to concentrate on whatever you're doing?	Better Than usual	Same as usual	Less than usual	Much less than usual
lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
felt capable of making decisions about things?	More so than usual	Same as usual	Less so than usual	Much less than usual
felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
been able to enjoy your normal day to day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
been able to face up to your problems?	More so than usual	Same as usual	Less so than usual	Much less able
been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
been feeling reasonably happy, all things considered?	Not at all	No more than usual	Rather more than usual	Much more than usual

PSSR - SR

Please answer the following questions according to what has happened DURING THE PAST TWO WEEKS using the scale 0-3 below.

0 Not at all	1 Once a week or less A little bit Once in a while	2 2-4 times a week Somewhat Half the time	3 5 + times a week Very Almost always
-----------------	---	--	--

In the past 2 weeks, have you had upsetting thoughts or images about any jobs you've been involved in, that came into your mind when you didn't want them to? 0 1 2 3

In the past 2 weeks, have you been having bad dreams or nightmares about any jobs you have been involved in? 0 1 2 3

In the past 2 weeks, have you had the experience of reliving an incident/ job, acting or feeling as if it were happening again? 0 1 2 3

In the past 2 weeks, have you been very emotionally upset when reminded of a job / incident (includes becoming very angry scared, sad, etc.) 0 1 2 3

In the past 2 weeks, have you been having any physical reactions (for example breaking out in a sweat, heart beating faster, hands shaking,)when reminded of a job/ incident? 0 1 2 3

In the past 2 weeks, have you been trying not to think about or have feelings associated with a particular incident or job? 0 1 2 3

In the past 2 weeks, have you been making efforts to avoid activities, situations or places that remind you of a particular incident or job? 0 1 2 3

In the past 2 weeks, have there been any important parts about a particular incident or job that you still can't remember? 0 1 2 3

In the past 2 weeks, have you found that you are not interested in things you used to enjoy doing? 0 1 2 3

In the past 2 weeks, have you felt distant or cut off from others around you? 0 1 2 3

In the past 2 weeks, have you felt emotionally numb (for example felt sad but unable to cry, unable to have loving feelings)? 0 1 2 3

In the past 2 weeks, have you felt any future plans or hopes have changed, because of the incident or job(for example, will have no career, marriage, children or long term plans)? 0 1 2 3

In the past 2 weeks, have you been having problems falling or staying asleep? 0 1 2 3

In the past 2 weeks, have you been irritable or having outbursts of anger? 0 1 2 3

In the past 2 weeks, have you been having difficulty concentrating (for example drifting in and out of conversations, losing track of a story on TV, having difficulty remembering what you've read)? 0 1 2 3

In the past 2 weeks, have you been overly alert (for example, checking to see who is around you, uncomfortable with your back to the door, etc.)? 0 1 2 3

In the past 2 weeks, have you been jumpier, more easily startled (for example when someone walks up behind you)? 0 1 2 3

MARLOWE-CROWNE SOCIAL DESIRABILITY SCALE

Personal Reaction Inventory

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *True* or *False* as it pertains to you personally.

Before voting I thoroughly investigate the qualifications of all the candidates	True	False
I never hesitate to go out of my way to help someone in trouble.	True	False
It is sometimes hard for me to go on with my work if I am not encouraged	True	False
I have never intensely disliked anyone	True	False
On occasion I have had doubts about my ability to succeed in life	True	False
sometimes feel resentful when I don't get my own way	True	False
am always careful about my manner of dress	True	False
My table manners at home are as good as when I eat out in a restaurant	True	False
If I could get into a movie without paying and be sure that I wouldn't be seen I would probably do it	True	False
On a few occasion I have given up doing something because I thought too little of my ability	True	False
like to gossip at times	True	False
There have been times when I felt like rebelling against people in authority even though I knew they were right	True	False
No matter who I'm talking to I'm always a good listener	True	False
I can remember playing sick to get out of something	True	False
There have been occasions when I took advantage of someone	True	False
I am always willing to admit it when I make a mistake	True	False
I always try to practice what I preach	True	False
I don't find it particularly difficult to get on with loud mouthed obnoxious people.	True	False
I sometimes try to get even rather than forgive and forget	True	False
When I don't know something I don't at all mind admitting it	True	False
I am always courteous, even to people who are disagreeable	True	False
At times I have really insisted on having things my own way	True	False
There have been occasions when I have felt like smashing things	True	False
I would never think of letting someone else be punished for my wrong doings	True	False
I never resent being asked to return a favour	True	False
I have never been irked when people present ideas very different from my own	True	False

I never make a long trip without checking the safety of my car	True	False
There have been times when I was quite jealous of the good fortune of others	True	False
I have almost never felt the urge to tell someone off	True	False
I am sometimes irritated by people who asks favours of me	True	False
I have never felt that I was punished without cause	True	False
I sometimes think that when people have a misfortune they only got what they deserve.	True	False
I have never deliberately said something that hurt someone's feelings.	True	False

LIFE SATISFACTION SCALE

Life Satisfaction

Below are five statements with which you may agree or disagree. Using the 1-7 scale indicate how much you agree with each statement by placing the appropriate number in the box next to that item.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

- ☐ In most ways my life is close to ideal.
- ☐ The conditions of my life are excellent.
- ☐ I am satisfied with my life.
- ☐ So far I have got the important things I want in life.
- ☐ If I could live my life again I would change almost nothing.

That is the end of the questionnaire pack.
Thank you Very Much for taking the time to complete it.

Interview Schedule

1. General Information

Age

Sex

Marital Status

Number of Children

Job Title

Number of Years in the Fire Service

Which Station and watch do you work on?

What was your occupation before you joined the Fire Service

2. Job Satisfaction

Reasons for joining the fire service ~ what attracted you to the job?

How satisfying do you find your job?

Very dissatisfyingdissatisfying

satisfyingvery satisfying

What aspects of your job do you find most satisfying?

Are there any other positive results for you that have come from your work as a fire fighter that haven't already been mentioned?

3. How well do you feel that the Brigade prepares you for the personal impact / stressful aspects of the job?

1. Do you feel that your training has prepared you for all aspects of the job?

Probe for further training needs.

4. How well does the Brigade support people as far as the personal impact of the job is concerned?

1. Is it generally accepted that there are some personal effects of fire-fighting?

Do you think that this is important?

Why / Why not?

2. Do you feel that fire fighters generally receive sufficient support for the work that they do? Yes / No

3. What support do you think should be available?

4. Would you use this support personally? Yes / No

5. Have you ever attended a Critical Incident debrief ? ~ Yes / No

If so how useful did you find it?

Why / Why Not?

6. What things do you think that the Brigade could do to make things easier?

Training?
Counselling?
Jigsawing?
Other?

5. Cumulative stress

1. In what ways do you feel that greater experience has changed the way you cope with stressful aspects of the job?
2. How busy is the unit? On average how often do you think you get called out to incidents?
3. Is it better to have a lot of incident or fewer?
4. Do you feel that there is a cumulative effect of stress?

6. Incident

Can you describe an incident that occurred recently (in the last 2 weeks) that you found somewhat stressful but is typical of the kind of work that you do.

7. Coping

1. How well do you think you coped with this incident personally?

2. What kind of things did you do to try and cope with it?

Do you try not to think about it?

Do you try just to get on with the job?

Do you try to think about it in a positive way?

Do you do things like make jokes to let your feelings out?

3. What do you feel is the best way to cope with going to incidents?

8. “What would you like to see happen as a result of this project?”

Let interviewee answer spontaneously, then probe for feelings and attitudes about counselling and training etc.

9. “Is there anything not covered in this interview that you would like to add?”

Is there anything you particularly wanted to say?

Or to be fed back to HQ?

Appendix 4

RELIABILITY ANALYSIS RESULTS OF PRIMARY COGNITIVE APPRAISAL SCALES

FACTOR 1 ~ POSITIVE APPRAISAL

Exciting

Informative

Invigorating

Thrilling

Enlivening

Instructive

Interesting

Enjoyable

Stimulating

Exhilarating

Cronbach's Coefficient Alpha = 0.9138

FACTOR 2 ~ DISTRESSING APPRAISAL SCALE

Depressing

Pitiful

Disgusting

Disturbing

Intolerable

Cronbach's Coefficient Alpha = 0.7773

FACTOR 3 ~ THREATENING APPRAISAL SCALE

Threatening

Fearful

Dangerous

Painful

Cronbach's Coefficient Alpha = 0.6571

FACTOR 4 ~ THRILL SEEKING APPRAISAL SCALE

Invigorating

Frightening

Terrifying

Enlivening

Cronbach's Coefficient Alpha = 0.7967

FACTOR 5 ~ CHALLENGING APPRAISAL SCALE

Depressing

Challenging

Instructive

Worrying

Cronbach's Coefficient Alpha = 0.6194

Appendix 5

SECONDARY COGNITIVE APPRAISAL /CONTROL EXPECTANCIES SCALE

FACTOR 1 - CHALLENGING

When you arrived at the incident you found it was a situation where you were unsure of how much influence you could have.

When you arrived at the incident you found it was a situation which was going to be just too much for you to cope with personally.

When you arrived at the incident you found it was a situation in which you needed more information before you could act.

When you arrived at the incident you found it was a situation which was likely to get out of control.

When you arrived at the incident you found it was a in which you felt you had to hold back from doing what you wanted to do.

N of cases (excluding missing values) = 88

Cronbach's Alpha = 0.7150

FACTOR 2 IN CONTROL

When you arrived at the incident you found it was a situation which you could deal with effectively.

When you arrived at the incident you found it was something you could change or do something about by your actions.

N of cases (excluding missing values) = 96

Cronbach's Alpha = 0.4403

FACTOR 3 ACCEPTANCE

When you arrived at the incident you found it was something you just had to accept.

Cronbach's Alpha cannot be calculated

Appendix 6

ON SCENE COPING SCALES AND SUB-SCALES

COGNITIVE APPROACH ~ Logical Analysis + Problem Solving

Cronbach's Coefficient Alpha = 0.7643

LOGICAL ANALYSIS

Think of different ways to deal with the situation

Try to step back from the situation and be more objective

Go over in your mind what you would say or do

Try to anticipate how things would turn out

Try to anticipate the new demands that would be place on you

Cronbach's Coefficient Alpha = 0.7103

POSITIVE APPRAISAL

Remind yourself of how much worse things could be

Try to see the good side of the situation

Think about how you were much better off than other people doing similar work

Tell yourself things would get better

Think about how this incident could change your life in a positive way

Cronbach's Coefficient Alpha = 0.6966

BEHAVIOURAL APPROACH ~ Seeking Support + Problem Solving

Cronbach's Coefficient Alpha = 0.8315

SEEKING SUPPORT

Try to work together with other people⁵ (Talk with a friend about the problem)

Talk with person in charge of the job (Talk with a professional person e.g. doctor, lawyer, clergy)

⁵ Item substituted for the original Coping resources Inventory item, shown in brackets

Seek help from people who have worked at similar incidents (Seek help from persons or groups with the same type of problem)

Try to find out more about the situation

Talk with other fire fighters about the incident (Talk with your partner or other relative about the problem)

Cronbach's Coefficient Alpha = 0.6122

PROBLEM SOLVING

Know what had to be done and try hard to make things work

Decide what you wanted and try hard to get it

Try at least two different ways to tackle the incident

think of the best way to tackle the job (Try to learn to do more things on your own)

Make a plan of action and follow it

Take things one day / one step at a time

Cronbach's Coefficient Alpha = 0.7795

COGNITIVE AVOIDANCE ~ Cognitive Avoidance + Acceptance / Resignation

Cronbach's Coefficient Alpha = 0.7526

COGNITIVE AVOIDANCE

Try not to feel part of the incident (Try to forget the whole thing)

Try to suppress your emotions (Try not to think about the problem)

Try not to think about the casualties as people (Daydream or imagine a better time or place than the one you were in)

Try not to think about the meaning of what you were doing (Try to put off thinking about the incident although you knew you would have to at some point)

Wish the incident would somehow go away or be over with

Try to deny how serious the accident actually was

Think about going off duty

Cronbach's Coefficient Alpha = 0.6663

ACCEPTANCE / RESIGNATION

Realise you had no control over the incident

Think that the outcome would be decided by fate

Accept it and get on with the job (Accept it, nothing could be done)

Expect the worst possible outcome

Lose hope that things would ever be the same

Try to resign yourself to what was happening and get on with the job (Feel that time would make a difference - the only thing to do was wait)

Cronbach's Coefficient Alpha = 0.5091

BEHAVIOURAL AVOIDANCE ~ Alternative Rewards + Emotional Discharge

Cronbach's Coefficient Alpha = 0.6272

ALTERNATIVE REWARDS

Try to help others deal with the Incident

Think about doing the job as well as possible (Get involved in new activities)

Try to keep busy at the incident (Read more often as a source of enjoyment)

Throw yourself into work and be guided by the rules (Turn to work or other activities to help you manage things)

Cronbach's Coefficient Alpha = 0.6102

EMOTIONAL DISCHARGE

Take it out on other people when you felt angry or depressed

Take a chance and do something risky

Yell or shout to let off steam

Do something you didn't think could work, but at least you were doing something

Cronbach's Coefficient Alpha = 0.5845

POST EVENT COPING SCALES AND SUB~SCALES

COGNITIVE APPROACH - Logical Analysis + Positive appraisal scales

Cronbach's Coefficient Alpha = 0.8552

LOGICAL ANALYSIS

Think of different ways to deal with the situation

Try to step back from the situation and be more objective

Go over in your mind what you would say or do

Try to anticipate how things would turn out

Try to find some personal meaning in the situation

Try to anticipate the new demands that would be place on you

Think trough the incident on your own in an objective way

(added item, α if item deleted = 0.6669)

Cronbach's Coefficient Alpha = 0.7310

Original Scale Cronbach's Coefficient Alpha = 0.6932

POSITIVE APPRAISAL

Tell yourself things to make yourself feel better

Remind yourself of how much worse things could be

Try to see the good side of the situation

Think about how you were much better off than other people doing similar work

Tell yourself things would get better

Think about how this incident could change your life in a positive way

Cronbach's Coefficient Alpha = 0.7698

BEHAVIOURAL APPROACH - Seeking Support + Problem Solving

Cronbach's Coefficient Alpha = 0.8288

SEEKING SUPPORT

Talk with you partner or other relative

Talk with a friend about the incident

Seek help from people or groups who have worked at similar incidents

Try to find out more about the situation

Talk to close colleagues about the incident and my feelings

(added item, α if item deleted = 0.6940)

Talk about your feelings in Critical incident debriefing

(added item, α if item deleted = 0.7216)

Cronbach's Coefficient Alpha = 0.7416

Original Scale Cronbach's Coefficient Alpha = 0.6149

PROBLEM SOLVING

Make a plan of action and follow it

Know what had to be done and try hard to make things work

Decide what you wanted and try hard to get it

Try at least two different ways to tackle the incident

Try to learn to do more things on your own

Think about the best way to deal with your feelings

(added item, α if item deleted = 0.6677)

Cronbach's Coefficient Alpha = 0.6823

Original Scale Cronbach's Coefficient Alpha = 0.6570

COGNITIVE AVOIDANCE - Cognitive Avoidance + Acceptance

Cronbach's Coefficient Alpha = 0.8022

COGNITIVE AVOIDANCE

Try not to think about the incident

Daydream or imagine a better time or place than the one you were in

Try to put off thinking about the incident although you knew you would have to at some point

Wish the incident would somehow go away or be over with

Try to deny how serious the accident actually was

Suppress your emotions (added item, α if item deleted = 0.7725)

Try to distract yourself and think about something else

(added item, α if item deleted = 0.7360)

Cronbach's Coefficient Alpha = 0.7954

Original Scale Cronbach's Coefficient Alpha = 0.7415

ACCEPTANCE

Feel that time would make a difference - the only thing to do was wait

Realise you had no control over the incident

Think that the outcome would be decided by fate

Accept it, nothing could be done

Try to accept what has happened (added item, α if item deleted = 0.6037)

Use home as refuge (added item, α if item deleted = 0.6764)

Cronbach's Coefficient Alpha = 0.6916

Original Scale Cronbach's Coefficient Alpha = 0.5607

BEHAVIOURAL AVOIDANCE ~ Alternative Rewards + Emotional Discharge

Cronbach's Coefficient Alpha = 0.7330

ALTERNATIVE REWRDS

Try to help others deal with the incident

Try to make new friends

Read more often as a source of enjoyment

Spend more time in recreational activities

Turn to work or other activities to help you manage things

Go out with the Watch (added item, α if item deleted = 0.5574)

Enjoy playing sports or engaging in other pastimes

(added item, α if item deleted = 0.6061)

Drink alcohol (added item, α if item deleted = 0.5872)

Cronbach's Coefficient Alpha = 0.6154

Original Scale Cronbach's Coefficient Alpha = 0.5847

EMOTIONAL DISCHARGE

Take it out on other people when you felt angry or depressed

Take a chance and do something risky

Yell or shout to let off steam

Cry to let feelings out

Do something you didn't think could work, but at least you were doing something

Release nervous energy through sports or other pastimes

(added item, α if item deleted = 0.5873)

Cronbach's Coefficient Alpha = 0.5587

Original Scale Cronbach's Coefficient Alpha = 0.6126

Table 20 ~ Pearson's Correlations Of Predictive Variables With Outcome Measures (n= 137)

	Severity Of Post Traumatic Stress Symptomatology Following CI	Post Traumatic Growth	Current Severity Of Post Traumatic Stress Symptomatology
Age	0.0981	0.1019	0.2055*
Rank	0.0319	0.0185	0.1402
Experience	0.0921	0.0944	0.1772
Mean Social Support	-0.0671	0.0205	-0.0975
Exposure to Critical Incident	0.4990**	0.3341**	0.2826**
Personal experience of prior trauma	0.2557*	0.2159*	0.2563**
Appraisal 1 - positive	-0.0757	0.1748	0.0131
Appraisal 2 - distressing	0.3603**	0.3958**	0.3004**
Appraisal 3 - threatening	0.4522**	0.5603**	0.2436*
Appraisal 4 - thrill seeking	0.2675*	0.4001**	0.1371
Appraisal 5 - challenging	0.0576*	0.4366**	0.1337
In control	-0.1139	0.1078	0.0446
Out control	0.3130**	0.2077	0.2066

On scene Cognitive approach Coping	0.1445	0.2912**	0.1001
On scene Cognitive Avoidance Coping	0.4108**	0.3379**	0.2607*
On scene Behavioural Approach Coping	0.1220	0.2185*	0.1436
On scene Behavioural Avoidance Coping	0.1864	0.2928**	0.1392
Post event Cognitive approach Coping	0.3908**	0.5680**	0.1932
Post event Cognitive Avoidance Coping	0.5311**	0.5173**	0.2624*
Post event Behavioural Approach Coping	0.4520**	0.5409**	0.2235*
Post event Behavioural Avoidance Coping	0.4197**	0.6407**	0.1325
Peritraumatic Dissociation	0.5878**	0.2683**	0.2313*

* p<0.05 ** p<0.01